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**1992  
LANGLEY AEROSPACE RESEARCH SUMMER  
SCHOLARS (LARSS) PROGRAM**

**FINAL REPORT  
June 2, 1993**

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AEROSPACE RESEARCH SUMMER SCHOLARS  
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## **Introduction**

The Langley Aerospace Research Summer Scholars (LARSS) Program was established in 1986 for the benefit of rising undergraduate juniors and seniors, and first-year graduate students who are pursuing degrees in aeronautical engineering or selected space disciplines of interest to NASA Langley Research Center (LaRC). Since its inception in 1986, the LARSS Program has reached unprecedented heights. That is, the number of participants has increased from 20 to 91, the stipend has increased from \$2,500.00 to \$4,000.00, and the length of the Program has increased from eight weeks. These increases signify that the summer research experiences of the LARSS participants are contributing to the scientific efforts of NASA LaRC and to the body of scientific knowledge as a whole.

The LARSS Program is intended to encourage high-caliber college students to both pursue and earn graduate degrees and to enhance their interest in aerospace research by exposing them to the professional research resources and facilities of LaRC. Two primary elements of the LARSS Program are (1) a research project to be completed by each participant under the supervision of a researcher who will assume the role of a mentor for the summer and (2) technical lectures by prominent engineers and scientists. Additional elements of this program include tours of LaRC wind tunnels, computational facilities, and laboratories. Library and computer facilities are available for all participants.

The LARSS Program is under the administrative control of the University Affairs Office within the Office of the Chief Scientist at NASA LaRC, and the sponsoring university, Hampton University. The purpose of this final program report is three-fold: (1) to address the changes the LARSS Program has experienced this year and provide recommendations for next year, (2) to identify the measures of success that were used this year to determine the overall health of the Program, and (3) to combine into one document pertinent information on the Program.

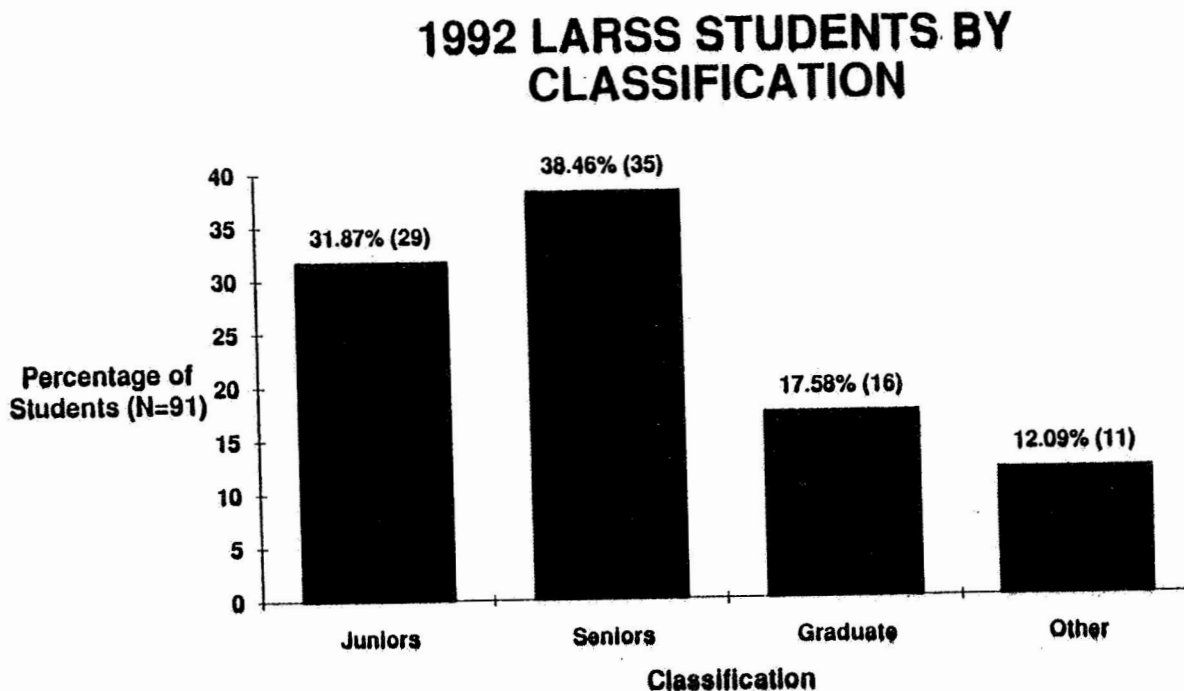


# **STATISTICAL PROFILE**

## STATISTICAL PROFILE

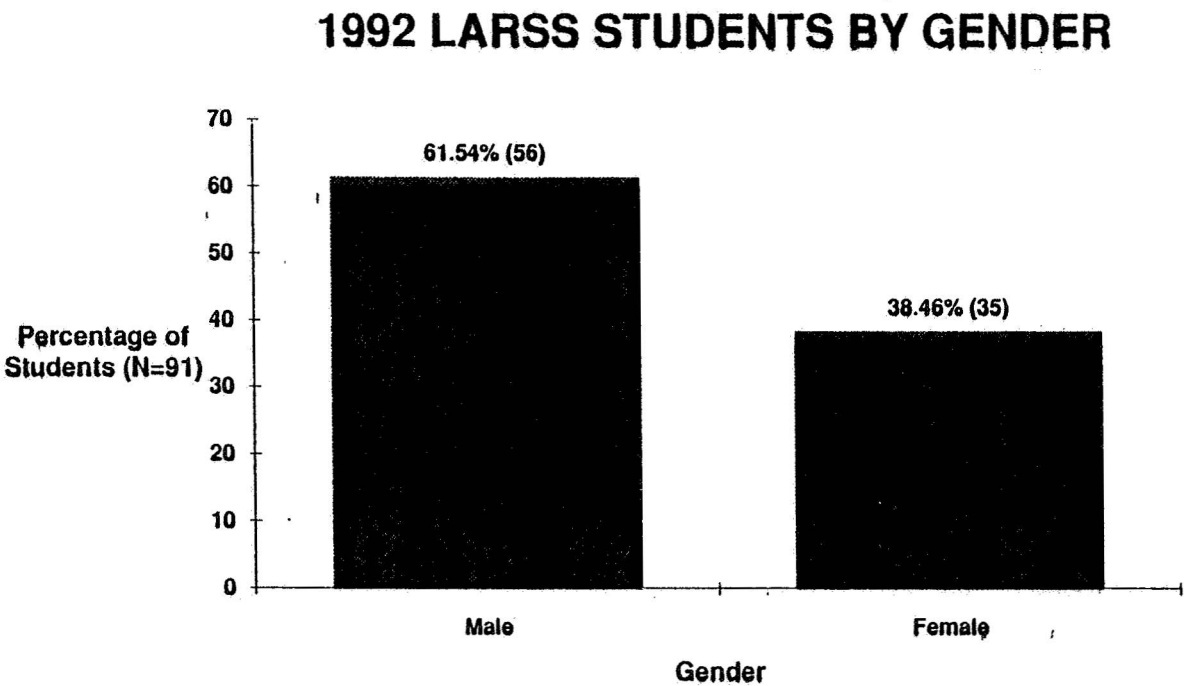
The 1992 LARSS Program consisted of 91 summer research scholars. Of the 91 participants, the majority (38.46%) were classified as seniors, followed by juniors (31.87%), graduate students (17.58%), and others (12.09%). (See Table 1 below).

Table 1. 1992 LARSS Students By Classification



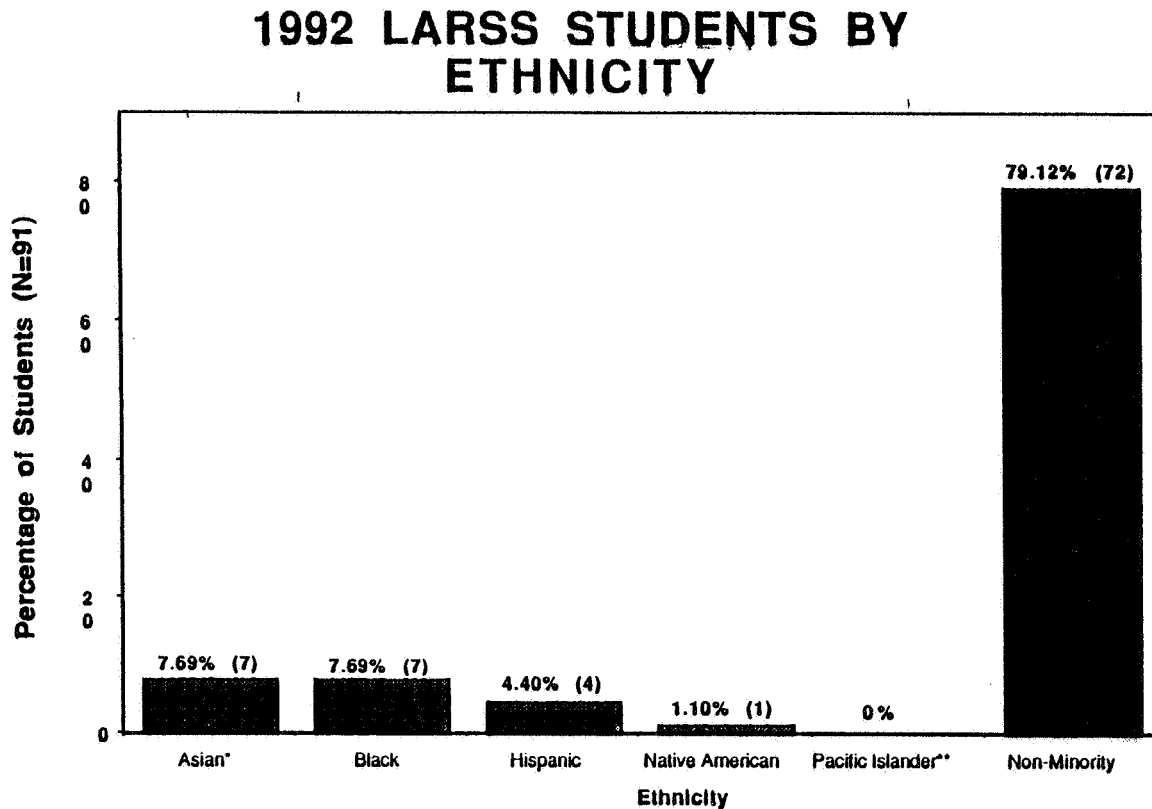
The majority of the participants (61.54%) were male, leaving 38.46% female participants. (See Table 2 below).

Table 2. 1992 LARSS Students By Gender



The majority (79.12%) of the participants were classified as Non-Minority, leaving 20.88% of the participants Minorities. Asian and Black representation in the Program were equal (7.69%, respectively), followed by Hispanic representation (4.40%), and Native American representation (1.10%). There was no Pacific Islander representation. (See Table 3 above).

Table 3. 1992 LARSS Students By Ethnicity

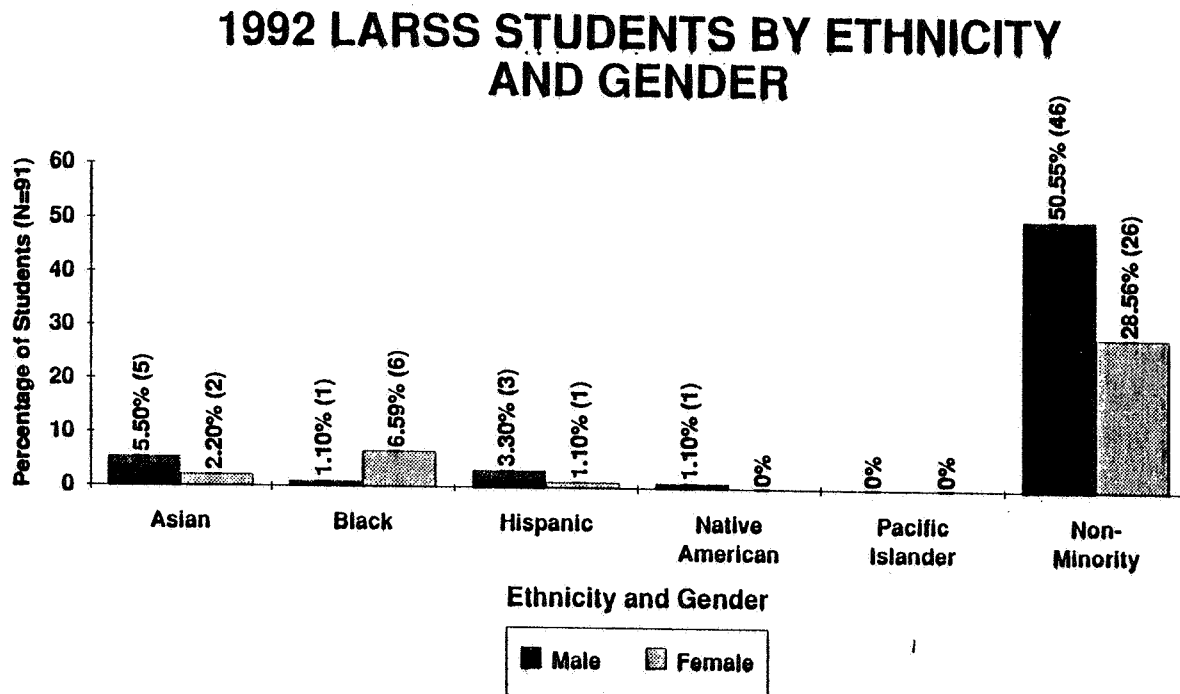


\*This area includes, for example, China, India, Japan and Korea.

\*\*This area includes any of the original peoples of Hawaii; the U.S. Pacific Territories of Guam, American Samoa, and the Northern Marianas, the U.S. Trust Territory of Palau; the Islands of Micronesia and Melanesia; and the Philippines.

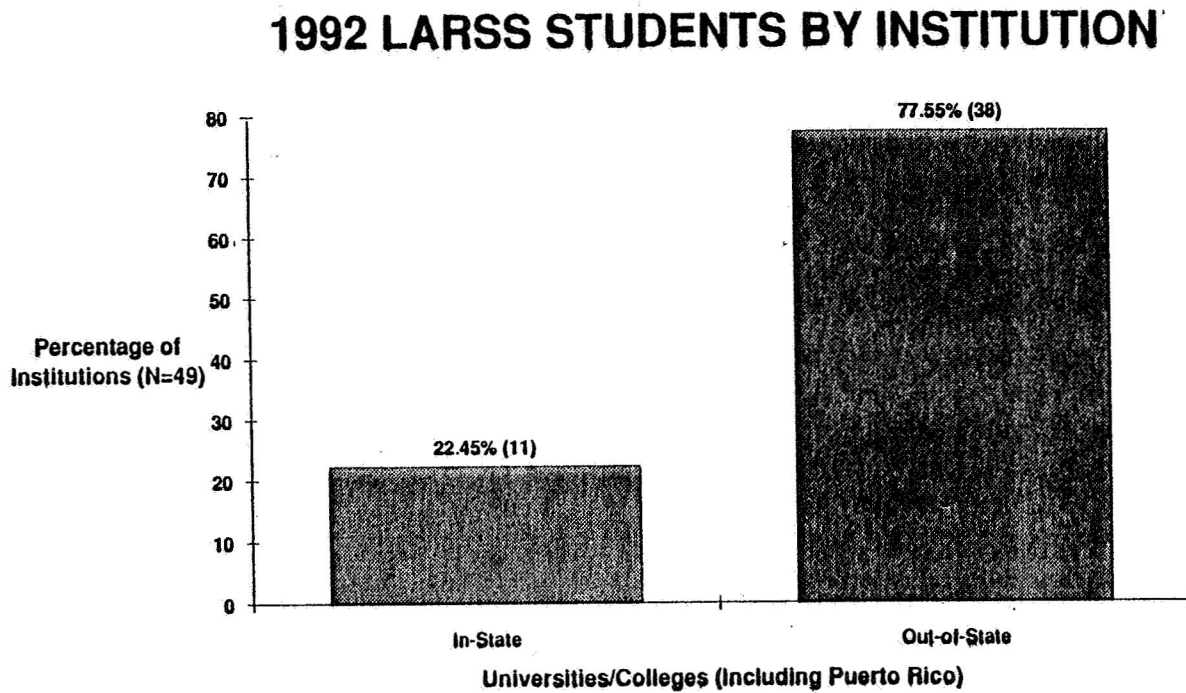
Slightly over half of the LARSS participants consisted of Non-Minority males (50.55%), while Non-Minority male representation in the five ethnic groups was greatest in the Asian ethnic group (5.50%), followed by Hispanic male representation (3.30%). Black male representation (1.10%) and Native American male representation (1.10%) were equal. There was no Pacific Islander male representation. Non-minority female representation was 28.56%. Female representation in the five ethnic groups was greatest in the Black ethnic group (6.59%), followed by Asian female representation (2.20%), and Hispanic female representation (1.10%). There was no female representation in either the Native American ethnic group or the Pacific Islander ethnic group. (See Table 4 below).

Table 4. 1992 LARSS Students By Ethnicity and Gender



The 91 LARSS participants represented 38 out-of-state institutions including Puerto Rico) and 11 in-state institutions. (See Table 5 below).

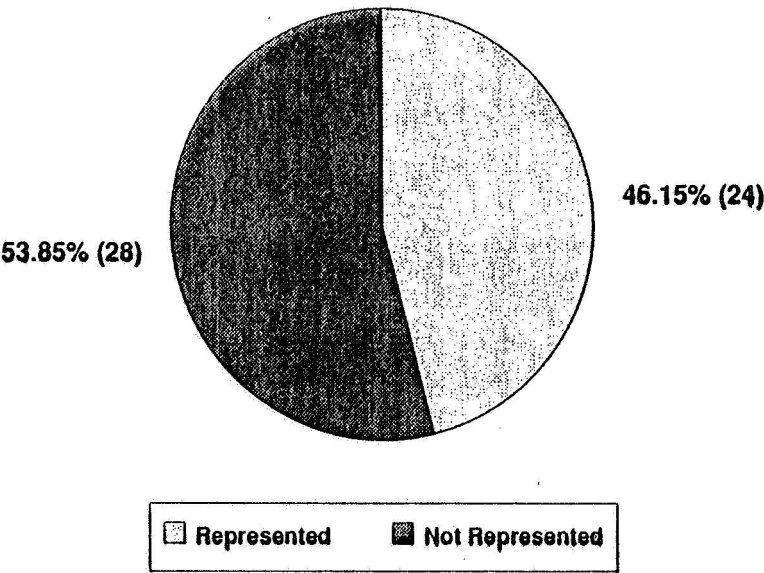
Table 5. 1992 LARSS Students By Institution



The 91 participants were representative of 24 of the 52 states (See Table 6 below).

Table 6. 1992 LARSS Students By State

1992 LARSS STUDENTS BY STATE



The mean G.P.A. for the 91 participants was 3.46, the highest in the history of the LARSS Program. In terms of academic disciplines, 17 of the 91 LARSS participants (18.68%) were double majors. Both Aerospace Engineering and Electrical Engineering represented 18.68% of the academic disciplines, respectively, followed by Mechanical Engineering (7.69%), Physics (7.69%), and Chemistry (4.40%). (See Appendix A. 1992 LARSS Students By Academic Discipline).

The 91 participants were placed in each Directorate, including the Office of the Director. The Structures Directorate had one-fourth (23) of the program participants, followed by Space (18), Aeronautics (15), Electronics (12), Flight Systems (9), Management Operations (6), Office of the Director (4), and Systems Engineering and Operations (4). (See Table 7 below). (See Tables 8-15 for 1992 LARSS Student Distribution for each Directorate, including the Office of the Director).

Table 7. 1992 LARSS Students By Directorate

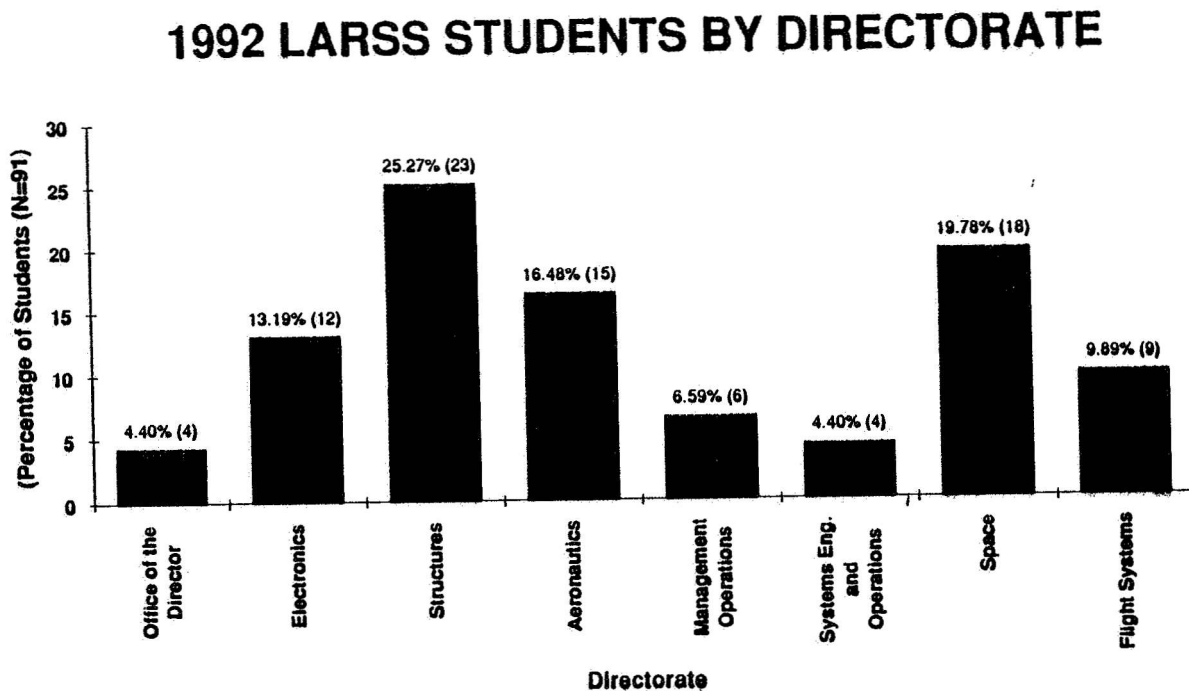




Table 8. 1992 LARSS Student Distribution Of Office of the Director

**1992 LARSS STUDENT DISTRIBUTION OF OFFICE OF THE DIRECTOR**

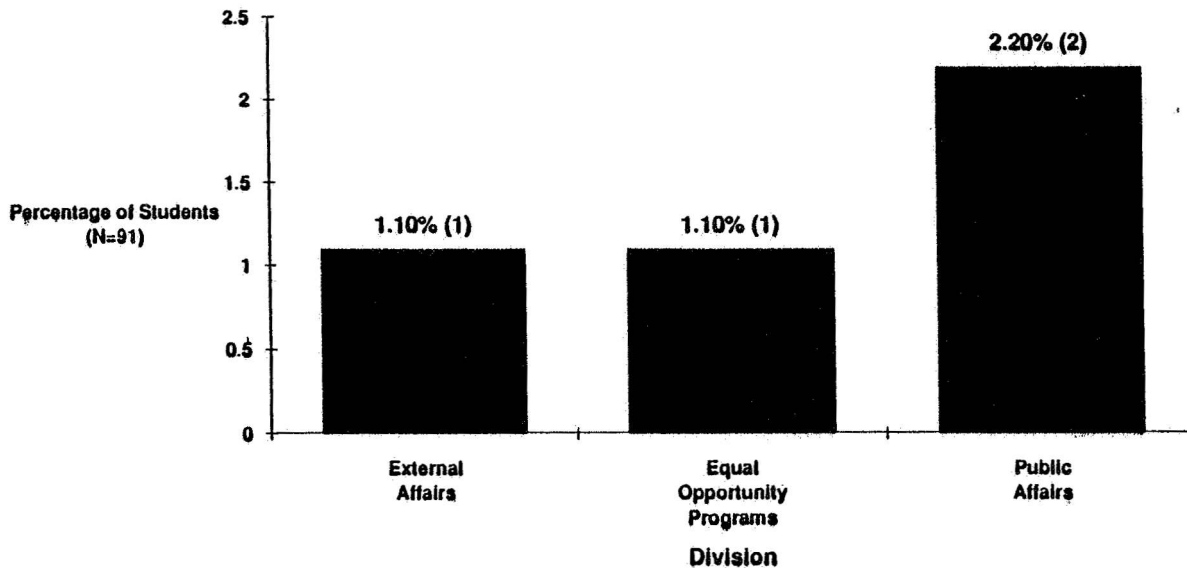


Table 9. 1992 LARSS Student Distribution Of Aeronautics Directorate

**1992 LARSS STUDENT DISTRIBUTION OF AERONAUTICS DIRECTORATE BY DIVISION**

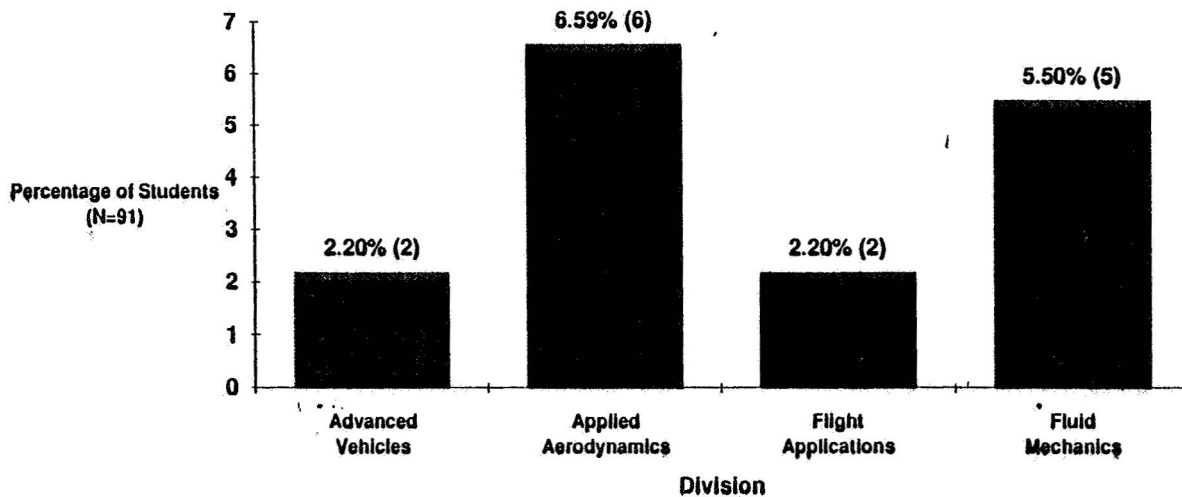


Table 10. 1992 LARSS Student Distribution of Electronics Directorate

**1992 LARSS STUDENT DISTRIBUTION OF SYSTEMS  
ENGINEERING AND OPERATIONS DIRECTORATE BY  
DIVISION**

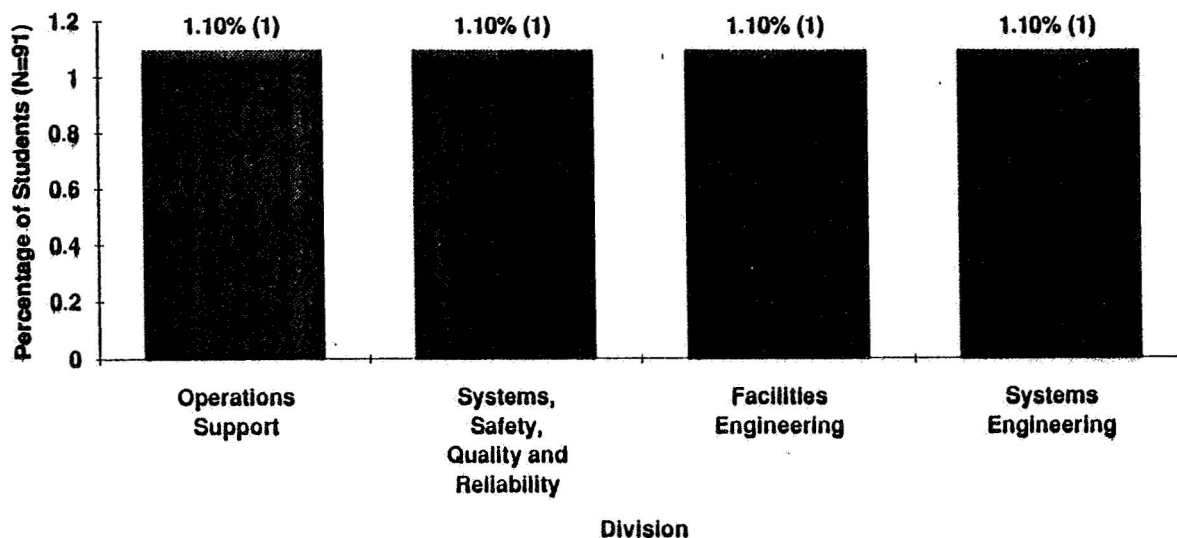


Table 11. 1992 LARSS Student Distribution Of Flight Systems Directorate

**1992 LARSS STUDENT DISTRIBUTION OF FLIGHT  
SYSTEMS DIRECTORATE BY DIVISION**

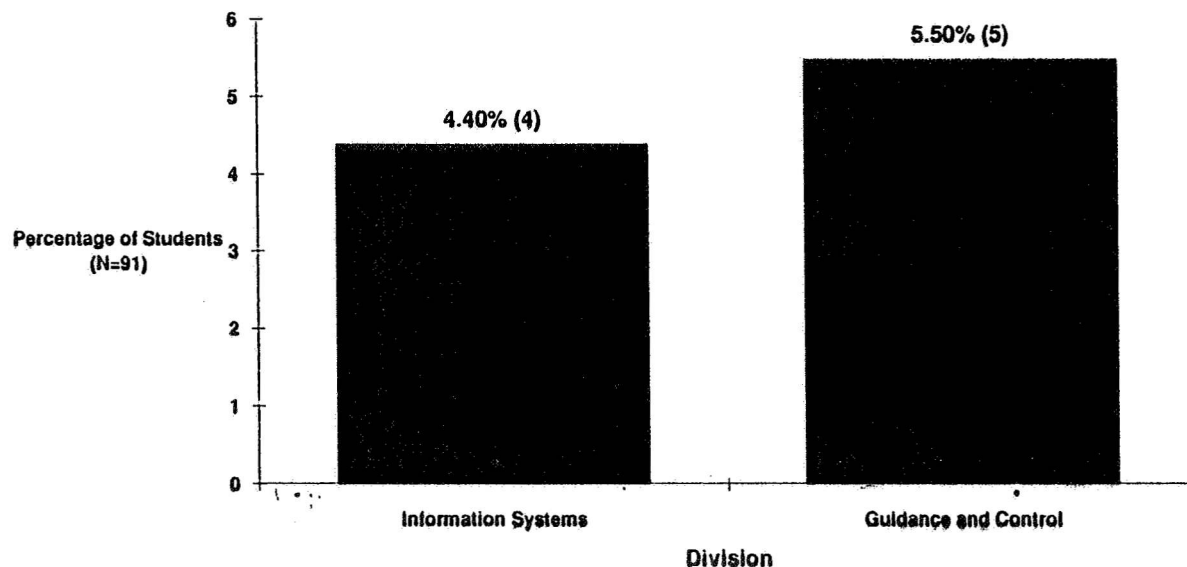


Table 12. 1992 LARSS Student Distribution Of Management Operations Directorate

**1992 LARSS STUDENT DISTRIBUTION OF MANAGEMENT OPERATIONS DIRECTORATE BY DIVISION**

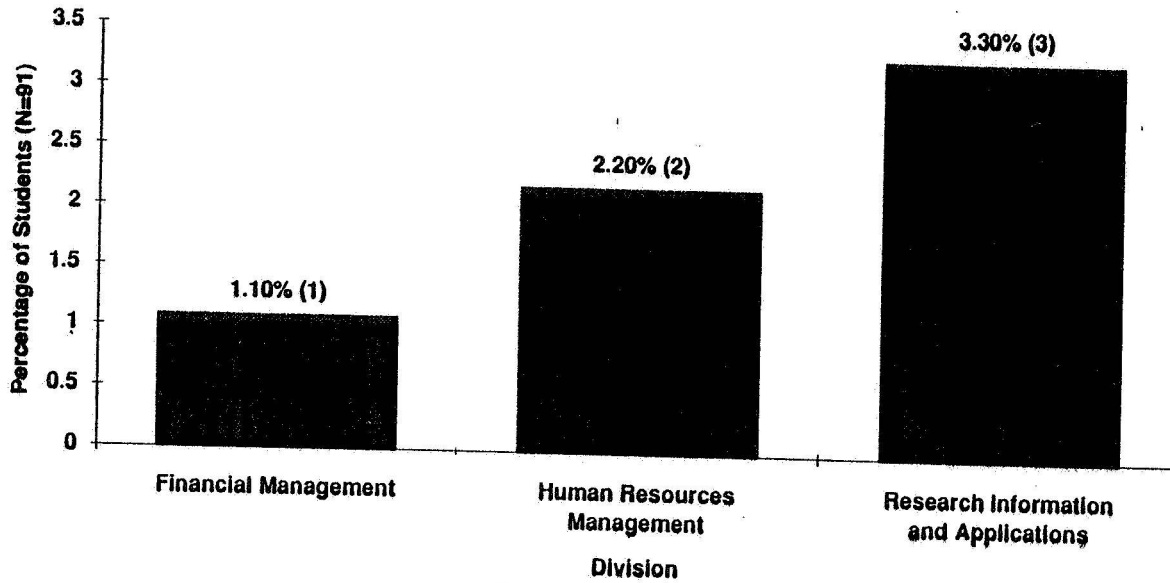


Table 13. 1992 LARSS Student Distribution Of Space Directorate

**1992 LARSS STUDENT DISTRIBUTION OF SPACE DIRECTORATE BY DIVISION**

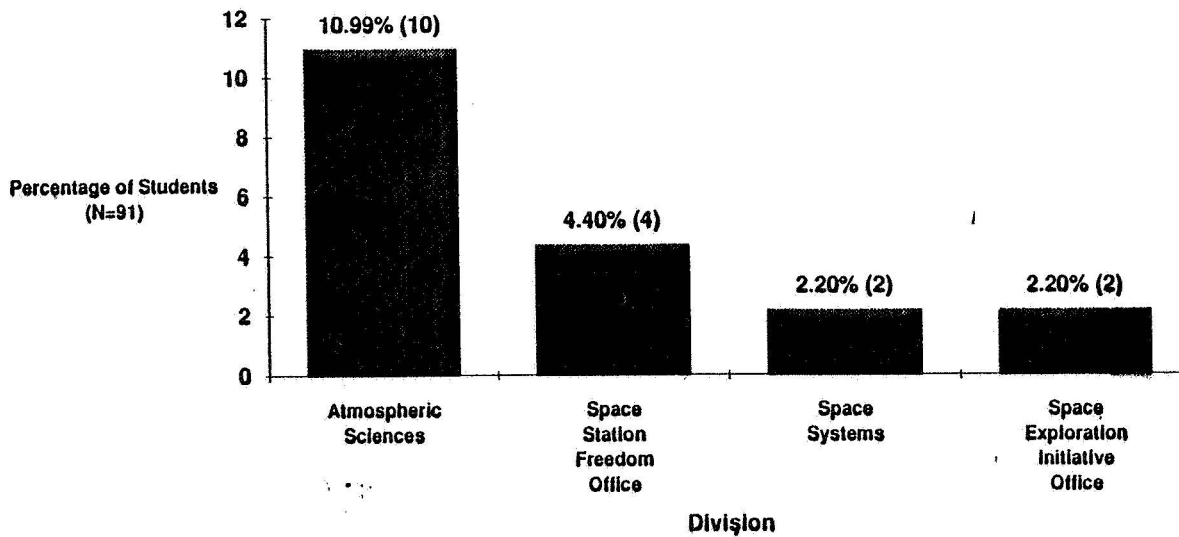


Table 14. 1992 LARSS Student Distribution Of Structures Directorate

### 1992 LARSS STUDENT DISTRIBUTION OF STRUCTURES DIRECTORATE BY DIVISION

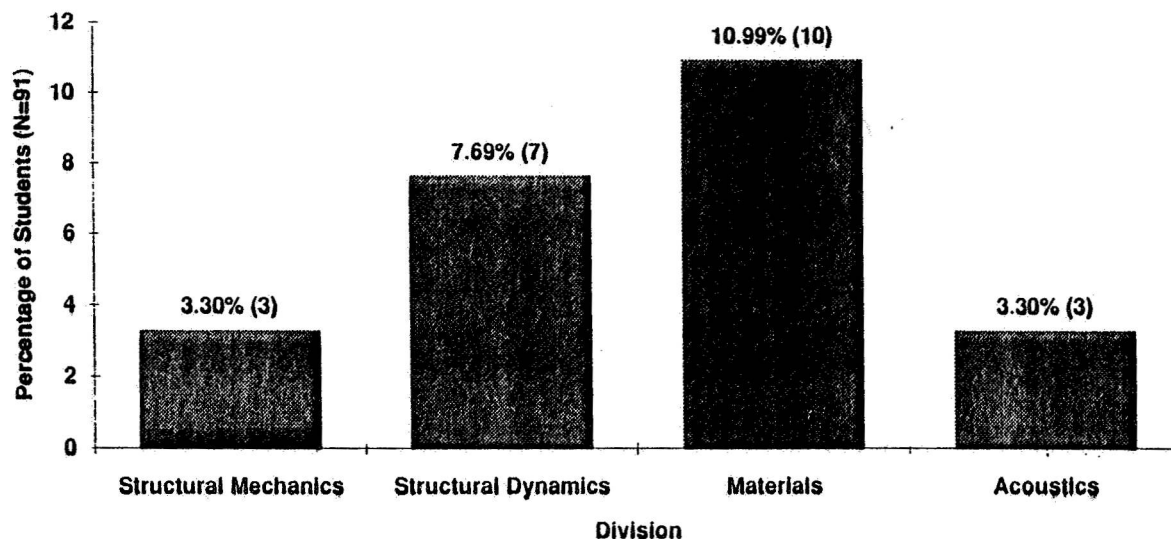
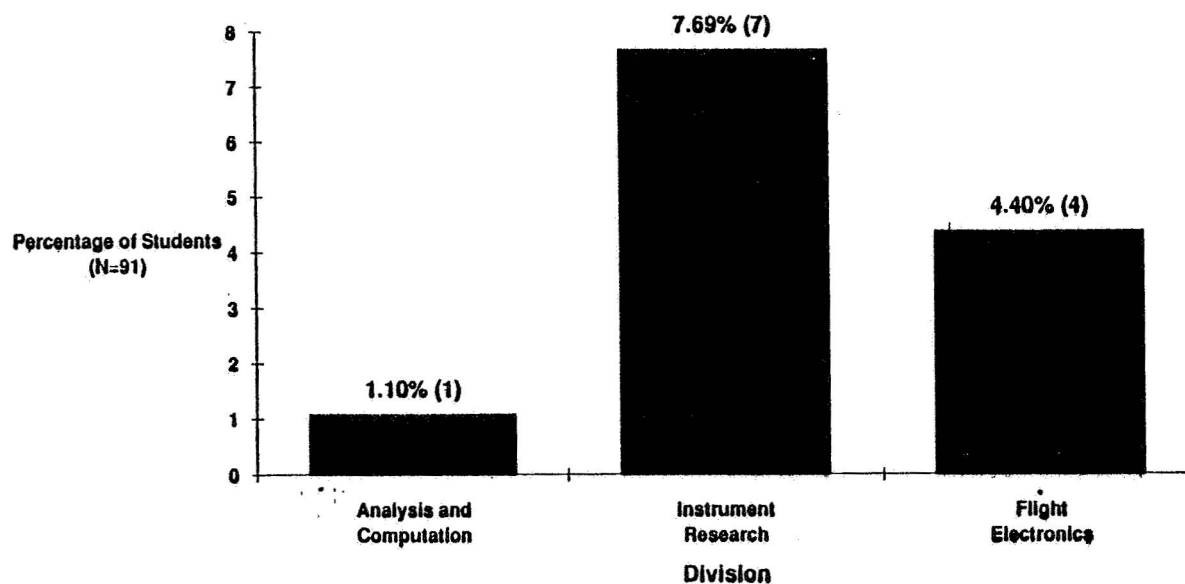


Table 15. 1992 LARSS Student Distribution Of Systems Engineering and Operations Directorate

### 1992 LARSS STUDENT DISTRIBUTION OF ELECTRONICS DIRECTORATE BY DIVISION

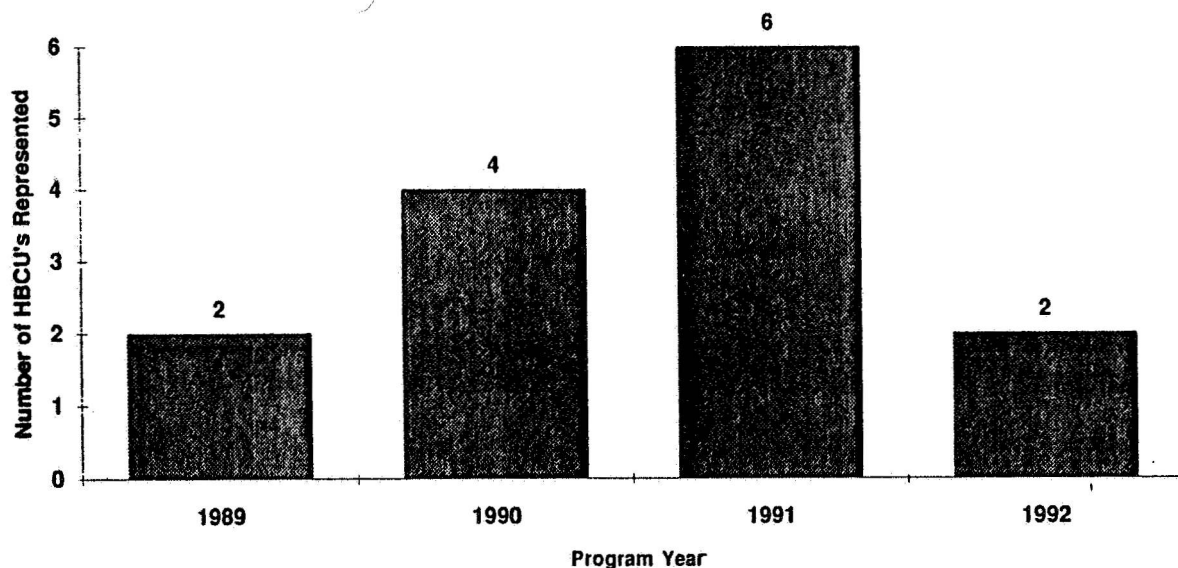


In terms of Division participation, the Atmospheric Sciences Division (ASD) and Materials Division (MD) both had 10 participants, followed by the Instrument Research Division (IRD) and the Structural Dynamics Division (SDYD) which had 7 participants each. The Applied Aerodynamics Division (AAD) had 6 participants, the Fluid Mechanics Division had 5, and the Guidance and Control Division (GCD) had 5.

Two Historically Black Colleges and Universities (HBCU's) were represented in the 1992 LARSS Program: Hampton University and North Carolina Agricultural and Technical State University. (See Table 16 below).

Table 16. HBCU Participation in the LARSS Program; 1989-1992

### **HBCU\* PARTICIPATION IN LARSS PROGRAM 1989-1992**



\*Historically Black Colleges and Universities

Other Minority Universities (OM's) represented include the University of Puerto Rico-Mayaguez, with two Program participants.

# **PROGRAM CHANGES**

## **Program Changes**

The 1992 LARSS Program has experienced many changes, which have contributed to the overall success of the Program. Even though all program changes do not have the same impact, each is nonetheless important. Following is a discussion of some of the more significant program changes that were implemented this year, and the impact, whether positive or negative, on the Program. Recommendations for the 1993 LARSS Program follows each section. (See Appendix B. 1992 LARSS Program Briefing Via: Program Changes).

## **Application Process**

Applications for the 1992 LARSS Program were due on the same date as the other programs run by the University Affairs Office; thus, other staff members were not able to assist with the application process. This had a negative impact on the overall Program due to the increased amount of work. In 1993, it is recommended that clerical support be obtained from the sponsoring university to assist with entering the information from each application into the database. Additionally, the core set of database fields for all University Programs should be continued in 1993. Software program options for the LARSS Program need to be explored; that is, the software used this year was not appropriate for the size of the LARSS Program.

## **Correspondence**

This year the distribution of correspondence to the participants in a timely manner was identified as a major area of concern. To ensure distribution of correspondence in a more timely manner for 1993, the following changes have been made on the LARSS Timeline: (1) the Housing and Welcome information will be combined with the Award Letter Package, and (2) dates have been established for all outgoing correspondence on the LARSS Timeline. (See Appendices C. 1993 LARSS Timeline and D. 1993 LARSS Administrative Timeline).

## **Housing**

This year housing overall has not necessarily been an improvement to the LARSS Program, but rather a learning experience. The broader range of both housing options and prices was an improvement over previous years, but a concern voiced from the Program participants was not having enough social interactions with their colleagues. As opposed to this year, 1993 LARSS students need to be housed in two or three apartment complexes only, instead of being spread out geographically. Suggested complexes for 1993 include Grafton Station, Oakwood, Chelsey, and possibly, Hampton Harbor. Housing information also needs to be distributed earlier. By moving the date up in the timeline, the information will be sent in a more timely manner.

## **Orientation**

The 1992 LARSS Orientation was well organized and ran smoothly. The mentors lined up at the end of the Program Breakout Session and called out the name of his/her student; this worked well and should be continued into 1993. Next year, the orientation should follow the same format, with each presenters' time being limited to 12 minutes. Also, NASA Form 531, Name Check Request, will be mailed in the Award Package to facilitate the check-in process. The 1993 Welcome Package should also include a LARSS Timeline. (See Appendix E. 1992 LARSS Orientation Agenda).

## **LARSS Activities Committee (LAC)**

The establishment of the LARSS Activities Committee (LAC) placed the responsibility of planning social activities for the students on the students rather than the University Affairs Office staff itself. Activities this year included a trip to Virginia Beach, Busch Gardens, Washington D.C. (National Air and Space Museum), nights of bowling and going to the movies. This committee should be continued next year; however, it has been determined that liability issues surrounding LAC activities need to be explored further. After consultation with legal council, a release form needs to be developed in 1993 for all activities related to the LARSS Program.



## **Mentor Roles and Responsibilities**

This year was the first year that the LARSS Mentors were made aware of their roles and responsibilities in writing. This letter clarified many areas which had previously been unclear to the mentors, and also clarified the roles and responsibilities of the University Affairs Office. This should be continued into the 1993 LARSS Program. Additionally, a Policies, Practices, and Procedures Manual has been developed for the Program. (See Appendix F. 1992 LARSS Policies, Practices, and Procedures Manual).

## **Picnic**

The 1992 LARSS Picnic, held on June 12, 1992, was well-attended. Changes this year include the elimination of decorations, a theme, and nametags. Also, a nominal fee was charged for admission to the picnic to help defray the costs of the entertainment (i.e. D.J. and clown). For 1993, it is recommended to increase the cost of admission to \$3.00 per adult and \$1.50 per child, eliminate the clown, and distribute tickets for alcoholic beverages. A designated individual should be at the keg at all times.

## **Paychecks**

Another major change in this year's Program was the distribution of paychecks by University Affairs Office staff, as opposed to the staff of the sponsoring university. This enhanced the overall communication between LARSS participants and the University Affairs Office staff by offering five additional points of contact, as opposed to less points of contact in previous years. In 1993, paychecks should again be issued bi-weekly by the University Affairs Office Staff, beginning the second Monday of the Program.

## **Technical Lecture Series**

The 1992 LARSS Technical Lecture Series consisted of five technical lectures by prominent NASA scientists and engineers. (See Appendix G. 1992 ASEE/LARSS Technical Lecture Series Schedule). Additionally, a program was developed to distribute at each lecture. (See Appendix H.

1992 Sample Program). This Program included a summary of the presenters biographical information, an abstract of the lecture to be given, and the announcement of the next lecture. The 1992 Technical Lecture Series was an integral part of the LARSS Program. Next year, technical lectures should not exceed 45 minutes, and the question and answer session should be extended to 20 minutes. A program needs to be distributed at each lecture. The number of technical lectures needs to be increased from five to six or possibly seven.

### **Longitudinal Study**

The establishment of a longitudinal study examining the effect of the intervention of Mathematics, Science, and Engineering Research Projects (conducted in conjunction with Langley Researchers), on LARSS participants' decisions to pursue or further their graduate studies has had a significant impact on the LARSS Program this year. Sponsored by NASA LaRC and Hampton University, this study will also enhance the tracking of former LARSS participants. It is recommended that this study continue during the academic year and following years. (See Appendices I. 1992 Longitudinal Study Timeline and J. 1992 LARSS Longitudinal Study).

### **Survey Development**

The development of the following three new survey instruments has also had a positive impact on the Program: (1) 1992 LARSS Orientation Evaluation Survey, (2) 1992 LARSS Student Exit Survey, and (3) 1992 Evaluation of LARSS Participant By Mentor. Each instrument allows certain variables to be measured and will be discussed in the third part of this document. It is recommended that these three instruments be continued into next year, and that additional survey instruments are developed to measure different aspects of the Program. Additionally, a mid-term survey needs to be developed and implemented next year.

### **Worksite Visits With LARSS Students**

This summer the LARSS Program Coordinator and the Acting University worksites; one in each Directorate. The purpose of these visits was to (1) see the student "in action" performing his/her research duties, and (2)

solicit suggestions, on an informal level, for continuous improvement of the LARSS Program. (See Appendix K. Sample Memo of LARSS Worksite Visit). Additionally, the Assistant University Affairs Officer and LARSS Program Coordinator had informal working luncheons with random LARSS participants after two Technical Lecture Series. Both visits enhanced the Program by getting student suggestions for continuous program improvement. The worksite visits should be continued in 1993, as should the informal working luncheons.

### **Researcher News Project**

In previous years, the LARSS participants have not been featured in the Researcher News, a Langley news publication. This year there was a series of articles written on both the LARSS and ASEE Programs. These articles heightened the awareness of the LARSS Program. To ensure that the articles are written in a timely manner, a roster of the LARSS participants needs to be routed to the Office of External Affairs during the first week of the 1993 Program. (See Appendix L. 1992 LARSS Articles).

### **LARSS Newsletter**

To facilitate communication among the Program participants, a LARSS Newsletter was developed towards the end of the Program this year. Six students contributed to this effort. (See Appendix M. 1992 LARSS Newsletter). This newsletter should be carried into the 1992-93 academic year to keep past participants abreast of one another's activities and to enhance the overall tracking process. A weekly newsletter should also be distributed during the ten-week LARSS Program.

### **1993 LARSS Policies, Practices, and Procedures Manual**

The 1993 LARSS Policies, Practices, and Procedures Manual is currently being developed to not only serve as a quick reference guide for the participants, but to facilitate their ten-week summer research experience at LaRC. This has had a positive impact on the Program in that this document combines much of the information which was traditionally distributed at Orientation. (See Appendix F. 1992 LARSS Policies,

Practices, and Procedures Manual). It should be included in the 1993 Welcome Packet and be updated each year thereafter.

### **Banquet**

The 1992 LARSS Banquet was held at the Langley Officers' Club. Each LARSS participant's dinner was paid in full (\$16.05) by the grant and civil servants had to pay \$16.05 per person. It is recommended in 1993 that each LARSS participant be charged \$5.00 or so to help defray the cost not only to the grant, but to guest and civil servants as well. Also, another location for the banquet should be explored.

### **Final Report and Presentations**

This year a Final Report was required of all LARSS participants and the Mid-term Report was eliminated. (See Appendix N. Final Report Format). Additionally, all Final Reports will be combined into one document and distributed to the LARSS participants and their mentors. It is recommended in 1993 that a more lengthy technical report be required, and participants should strongly be encouraged to present their research orally to each respective Directorate.

# **MEASURES OF SUCCESS**

## **MEASURES OF SUCCESS**

The purpose of the following three survey instruments: (1) 1992 LARSS Orientation Evaluation, (2) 1992 LARSS Student Exit Survey, and (3) 1992 Evaluation of LARSS Participant By Mentor Survey, and the longitudinal study implemented this year in the LARSS Program, is to serve as a starting point for measuring the Program over a number of years to ensure significant improvement over time. Thus, measuring variables independently was a beginning of this process. The survey instruments measure the success of certain variables related to the Program; each of which will be discussed below.

### **A. Longitudinal Study**

The longitudinal study was established to measure the effect of the intervention of Mathematics, Science, and Engineering Research Projects (conducted in conjunction with Langley Researchers), on LARSS participants decision to pursue or further their graduate studies. Sponsored by NASA LaRC and Hampton University, this study will continue into the academic year. (See Appendix J. 1992 LARSS Longitudinal Study).

### **B. Orientation Evaluation**

The purpose of the LARSS Program Orientation is: (1) to provide LARSS Program participants with pertinent information regarding NASA LaRC and (2) to facilitate their 10-week stay at the Center. In order to evaluate the orientation, as well as the pre-conference communication with the participants, the 1992 LARSS Orientation Evaluation was developed to measure the effectiveness of the following five areas: (1) Overall Organization, (2) Pre-conference Notification, (3) Information and Knowledge Gained at the Orientation, (4) Program Breakout Session, and (5) General Rating of the Orientation. This evaluation is also used as a tool to follow with NASA's goal of "continuous improvement". That is, by critically examining the five aspects of the orientation from an objective viewpoint, the appropriate changes can be implemented or made within the LARSS Program. The recommendations made will ensure a more successful and improved 1993 LARSS Orientation and overall program.

The overall organization of the 1992 LARSS Program Orientation, as well as the general rating of the orientation, yielded favorable comments from 94% of the respondents. Thus, these two areas are not of major concern at this time. Similarly, the overwhelming majority of the respondents rated the program breakout session highly. Hence, the overall organization of the orientation, as well as that of the program breakout session will remain the same. The information and knowledge gained at the orientation was rated as beneficial by 95% of the respondents and appears to facilitate the student's transition to LaRC. Even though four of the five areas addressed in the survey were rated favorably overall, the one area which reflects an inherent weakness is the pre-conference notification. Close examination of the comments made by the respondents reflect that correspondence and notification must be done roughly one month earlier in the future. This orientation evaluation is reflective of both the strengths and weaknesses of the 1992 LARSS Orientation, as well as some general elements of the LARSS Program, like timeliness of correspondence. (See Appendix O).

### **C. Student Exit Survey**

The 1992 LARSS Student Exit Survey is intended to serve as a tool for continuous improvement of the overall LARSS Program. That is, the LARSS Program participants are able to provide valuable information about the overall Program by identifying those areas of the Program which need enhancing. The recommendations provided from this survey will be considered for the 1993 LARSS Program. This survey is a measure of success in that it is reflective of the overall summer research experience the LARSS Program provided for its participants. That is, the overwhelming majority of the LARSS participants rated their overall summer research experience as good or excellent. Even though the 1992 LARSS Program has met its' goals, all areas of the Program need to be considered for continuous improvement. Of the various recommendations provided by the participants, the following will be implemented in the 1993 LARSS Program: (1) LARSS participants will be housed in two or three apartment complexes, (2) mentors will be encouraged to contact their student before the beginning of the LARSS Program, (3) LARSS participants will be notified of a tentative payroll schedule before the Program begins, (4) LARSS participants will be strongly encouraged to

give an oral presentation on their research project in their respective Divisions, and (5) a Career Conference, in conjunction with a forum where the participants can share their individual research projects, will be held. The participant recommendations made in the 1992 LARSS Student Exit Survey will ensure a more successful and improved LARSS Program in 1993. (See Appendix P).

#### **D. Evaluation of LARSS Participant By Mentor Survey**

The 1992 Evaluation of LARSS Participant By Mentor Survey is intended to serve as a tool for the Langley Mentors to measure the student's ability as compared to a representative group of students who have approximately the same amount of experience and training on the following four levels: (1) degree of mastery of fundamental knowledge in the general field, (2) knowledge of and ability to use basic research techniques in this field, (3) self-reliance and independence in scientific work, and (4) motivation toward a successful productive scientific career. This survey is a measure of success in that it represents the quality of the student researcher and his/her abilities to contribute to NASA LaRC. (See Appendix Q).

The majority of the students (56.58%) were rated by their mentor as having an outstanding degree of mastery of fundamental knowledge in the general field, followed by a truly exceptional degree of mastery (19.74%), unusual (11.84%), good (9.21%), and somewhat above average (2.63%). Similarly, the majority of students (52.63%) were rated as having knowledge of and ability to use basic research techniques in this field, followed by truly exceptional (26.32%), unusual (9.21%), good (7.89%), and somewhat above average (3.95%).

The majority of the students (52.63%) were rated as truly exceptional in terms of self-reliance and independence in scientific work, followed by outstanding (27.63%), good (10.53%), and unusual (9.21%). Similarly, the majority of the students (53.95%) were rated as truly exceptional in terms of motivation toward a successful productive scientific career, followed by outstanding (39.26%), unusual (10.53%), good (2.63%), and somewhat above average (2.63%).



When the mentors compared their student overall with other students they had previously supervised, the majority of the students (52.63%), were rated as equal to the best, followed by very good (32.89%), above average (10.53%), and average (3.95%). None of the students were rated as below average. The results of this survey suggest that even though the majority of the students were rated as outstanding in the first two areas, they were rated truly exceptional in the last two areas; self-reliance, independence, and motivation are important attributes to have to gain further knowledge and research skills in a chosen field. In general, the remarks made by the mentors were very positive; they signify how enriching a summer research experience is to a student in the short-term. It will be interesting to (1) see if these surveys have the same continuing effect in 1993 and (2) to measure the longevity of the LARSS summer research experience.

## 1992 LARSS STUDENTS BY ACADEMIC DISCIPLINE

<b><u>Academic Discipline</u></b>	<b><u>N</u></b>
Aeronautical Engineering/Aerodynamics	1
Aeronautical Engineering/Astronautical Engineering	1
Aerospace/Aeronautical Engineering	1
Aerospace/Mechanical Engineering	1
Aerospace/Ocean Engineering	1
Aerospace Engineering	17
Applied Optics	1
Applied Optics/Mathematics	1
Biology	1
Business Administration	1
Ceramic Engineering	1
Chemistry	4
Chemistry/Chemical Engineering	2
Civil Engineering	3
Clinical Psychology	1
Communication	1
Computer Engineering	1
Computer Science/Mathematics	1
Computer Science	3
Electrical Engineering/Computer Science	1
Electrical Engineering	17
Engineering Physics	1
English	1
Environmental Health	1
Environmental Science	1
Industrial Technology	1
Journalism	1
Marketing/PR	1
Mass Media Arts	1
Materials Engineering	1
Material Sciences & Engineering	4
Mechanical/Aeronautical Engineering	2
Mechanical Engineering	7
Metallurgical Engineering	1
Photography	1
Physics	7
Physics/Mathematics	1
Psychology	3
Quantitative Psychology	1
Systems Science Engineering	1

Total =91

**\*\*UPDATED\*\*****1992 LARSS PROGRAM BRIEFING VIA: PROGRAM CHANGES****Presented by Suzanne Boyd**

1. Switching Universities - Hampton University has been very cooperative and accessible and is working well with us in terms of conducting a longitudinal study and tracking LARSS students.
2. Longitudinal study - This will enhance tracking of LARSS students in the future and allow us to determine whether the intervention with mathematics, science and engineering research projects conducted in conjunction with Langley researchers will channel and encourage students to either pursue graduate school or further their graduate education in areas of interest to NASA.
3. Applications - Applications for all programs, including LARSS, were due on the same date this year. Even though this facilitated the application process, staff members were not able to help one another as much as in the past because they were each busy with their respective programs. Next year, due dates should perhaps be spaced accordingly. **Recommendation:** *Obtain clerical support from HU next year to assist with the application process.*
4. Database - This year as opposed to last year, there was a core set of information for all programs. Next year, the application form should conform to the database to save time putting the information into the computer; the core set of information for all programs should continue. **Recommendation:** *pExplore software program options for next year as software used for the LARSS Program this year was not appropriate.*
5. Distribution Meeting - One distribution meeting for all programs for selections was an improvement in terms of time efficiency. The only down-side is that too much information is being distributed at one time; there may not be enough time to process information from the Directorate perspective. Two distribution meetings, as opposed to one, should be considered for next year. **Recommendation:** *Distribute a schedule as to when the applications will be routed to the Directorate for each specific program.*

6. Individual Files - There was not an individual file for each applicant this year in 1219 or 1312; thus, saving time in terms of clerical work. Only those individuals selected had an individual file made for 1312. Next year continue to make files for only those selected.
7. Selections - No mailings of selections were made until after PR's were processed. Next year, a date needs to be established for all PR's to be processed. **Recommendation:** *Establish date on 1993 timeline when all PR's have to be processed.*
8. Rejection Letters - Rejection letters went out as scheduled because the deadline was moved up. Date will be recommended on PY 93 Timeline.
9. PR's - PR's were done as requests came in as opposed to requesting funding for 10 slots beforehand. That is, once a student was selected, a PR was cut for that student. Previously, the Directorates were asked for funding for 10 students before the students were selected. Next year continue to cut PR's as requests come in.
10. Mailing Packages - It has been determined that combining welcome information, housing, and selection packages needs to be done simultaneously next year to facilitate mailings being completed in a timely manner. Date will be recommended on PY 93 Timeline.
11. Housing - This year has not necessarily been an improvement, but a learning experience. That is, it is suggested to locate LARSS students in two or three apartment complexes only, instead of spreading them out geographically. Also, apartment complexes need to be "locked-in" early. If a student chooses not to live in one of the three suggested complexes, perhaps it should be made clear that they are on their own in terms of finalizing housing arrangements. However, we should provide them with as much assistance as possible. Suggested complexes for next year are Oakwood, Grafton, and Chelsey.  
**Recommendation:** *Dr. Venable will follow-up with Hampton Harbor Apartments to explore what arrangements could possibly be made for housing LARSS participants in 1993.*

12. Orientation - Overall, organization was good. Evaluations were positive (a useful tool for program improvements). Also, sending 501's with welcome package made the student's check-in much smoother and the students' introducing themselves helped the mentor identify them early on. A timeline for students should be included in the welcome packet next year.
13. Picnic - The elimination of decorations, a theme, and nametags facilitated the planning process and allowed the money which was charged for the picnic to be contributed toward entertainment (DJ and Clown) to help defray the costs. Checking I.D.'s also an improvement. Continue this year's changes for the 1993 picnic. **Recommendation:** *The cost of the picnic should be increased to \$3.00 per adult and \$1.50 per child.*
14. Lecture Series - Writing the Directorate POC's and asking for recommendations for each Directorate for Lecture Series assisted with selection of speakers. However, one or two more lectures are needed. Suggested areas for additional lectures are the Long Duration Exposure Facility (LDEF) or the HL20 Personnel Launch System. Program for lecture series was also a positive change and should be continued next year. **Recommendation:** *Presentations should be 45 minutes in length with more time for questions and answers and the idea of an outside speaker should be entertained.*
15. LARSS Activities Committee (LAC) - The students who were interested in this committee signed up at orientation and one person was voted to be chair. Activities thus far have been well attended because the student's themselves selected them. Most importantly, however, is the fact that it has not taken UAO staff time to plan these activities. LAC should be continued next year. **Recommendation:** *It was determined that liability issues definately need to be discussed further between Mr. Robert L. Yang and Dr. Demetrius Venable; after consultation with legal council, a release form (in terms of liability) needs to be developed for all activities related to the LARSS Program; policies and procedures manual will be developed by Suzanne Boyd.*

16. Final Report - The format is reader friendly and the midterm report has been eliminated. Plan of Research was also eliminated. It is tentatively planned to put all LARSS final reports into a final publication. Next year review final report format for appropriate changes. **Recommendation:** *Final presentations need to be made by students to their respective division or branch.*
17. Exit Survey - A new exit survey was developed and serves as a vehicle of how to improve the LARSS Program. Next year review exit survey for appropriate changes.
18. Paychecks - This year paychecks were distributed by UAO staff members as opposed to the university, like GWU last year. This offered five additional points of contact with the students as opposed to only the technical lecture series last year. If possible, continue arrangements such as these next year. **Recommendation:** *If a pay check is to be ready for the LARSS participants on the first Friday of the program, the grants document and a list of the students participating in the program must be at Hampton University at least 2 weeks prior to the beginning of the program.*
19. Banquet - Student's dinner is paid in full. Next year, it is recommended that they be charged a nominal fee (like \$5.00 or so) to help defray the costs not only to the guests and civil servants, but to the UAO as well.
20. Researcher News Project - Articles were written by Whitney Bartlett, a summer intern in the Office of External Affairs, featuring LARSS students and mentors, as well as ASEE Summer Faculty Fellows and LaRC Associates, from the seven Directorates. A list of all LARSS and ASEE program participants will appear in the last issue of the Researcher. This project should be continued for next year, but started immediately when the students and Fellows arrive.
21. LARSS Newsletter - **Recommendation:** *Develop a newsletter to be distributed biweekly to students during the summer and quarterly during the academic year.*

## 1993 LARSS TIMELINE

Keep Open Line of Communication with HU (Dr. Demetrius Venable)	Ongoing
Distribute 1993 Information Guide	September-----
Track Former LARSS Participants (In general)	September-December
Recruit 1993 LARSS Students	September-January 1
Prepare Summer Serge Input	November
Applications Due	February 1
Letter - Directorate re: Application, Distribution Meeting, Directorate Selection Form, and Sample PR's	February 1
Process Applications	January 1-February 14
Distribute to Directorates	February 15
Directorate Review	February 15-March 1
Prepare Award Letter Package (Includes Housing & Welcome Information)	January-February
Selections Due in UAO	March 1
Processing of all PR's Due	March 1
Finalize Technical Lectures	March 1-5
Finalize Orientation Agenda	March 1-5
Rejection Letters Mailed	March 1-12
Award Letter Package Mailed	March 1-5

Rejection Letters Mailed	March 1-12
Award Letter Package Mailed	March 1-5
Welcome Package Mailed	March 1-5
Housing Package Mailed	March 1-5
Housing Forms Due in UAO	March 15-19
Acceptance Letters Due in UAO	March 15-19
Letter - Mentors re: Students Acceptance and Mentors Roles and Responsibilities	April
Notify Students of Housing	March 29-April 2
Orientation Agenda Mailed	March 29-April 2
Technical Lecture Schedule Mailed	March 29-April 2
Schedule Meeting with UAO re: orientation, picnic, and banquet	April 5-9
Prepare Orientation Packet	April 12-16
Letter - Activities Center re: Lecture Series and Schedule	April 19-23
Rosters to Security, Badge & Pass, Credit Union, Telephone Operators, Fitness Center, Library, Official Files	April 26-30
Letter - Credit Union and LAFB re: check cashing privileges and use of open mess facilities	May 3-8
Designate Date For Group Photo	May 3-8
Grants Documents and Roster to HU for Payroll Purposes	May 10-14



Letter - Mentors re: picking up student, orientation agenda, and TLS schedule	May 10-14
Letter - TA's/SA's; Directors For; Additional Senior Staff re: orientation agenda, roster, & TLS schedule	May 10-14
Contact Susan Linton in Security - make arrangements for orientation	May 10-14
Roster to Jane Derby (Learning Center) re: training for LARSS students	May 10-14
Roster to Researcher News for articles	May 17-21
Directorate roster of LARSS and ASEE participants to TA's/SA's for directorate recommendations	May 17-21
Letter - Picnic Invitations	May 24-28
Orientation/Program Starts	June 7
Letter - Orientation Presenters re: thank you	June 7-11
Organize LAC and LARSS Newsletter	June 7-11
Revision of LARSS Certificate to Graphics	June 14-18
Technical Lecture - Aeronautics Directorate	June 15
Payday #1	June 18
Picnic	June 18
Technical Lecture - Electronics Directorate	June 22
Technical Lecture - Space Directorate	June 29
Payday #2	July 2

Technical Lecture - Structures Directorate	July 6
Technical Lecture - Flight Systems Directorate	July 13
Payday #3	July 16
Graphics - work order for names on certificates	July 12-16
Awards Banquet	July 28
Payday #4	July 30
Payday #5	August 13
Final Reports Due in UAO	August 9-13
Final Checkout Records Due	Prior to August 13 Payday

## 1993 LARSS ADMINISTRATIVE TIMELINE

Keep Open Line of Communication with HU (Dr. Demetrius Venable)	Ongoing
Distribute 1993 Information Guide	September-----
Track Former LARSS Participants (In general)	September-December
Recruit 1993 LARSS Students	September-January 1
Prepare Summer Serge Input	November
Initial Contact With Manager of Activities Center to Schedule Orientation, Lecture Series, Picnic	January 4-8
Applications Due	February 1
Letter - Directorate re: Application, Distribution Meeting, Directorate Selection Form, and Sample PR's	February 1
Process Applications	Jan 1-Feb 14
Distribute to Directorates	February 15
Directorate Review	February 15-March 1
Prepare Housing Package & Welcome Package	January-February
Selections Due in UAO	March 1
Processing of all PR's Due	March 1
Finalize Technical Lectures	March 1-5
Finalize Orientation Agenda	March 1-5
Discuss list of disabled students with Diane Forrest	March 8-12

Acceptance Letters Due in UAO	March 15-19
Notify Students of Housing	March 29-April 2
UAO & Support Staff Meeting	
re: Orientation, Picnic, and Banquet	April 5-9
Letter - Mentors re: Picking Up Student, Orientation Agenda, and TLS Schedule	May 10-14
Letter - Division Coordinators; Directors For; Additional Senior Staff re: Orientation Agenda, Roster, & TLS Schedule	May 10-14
Letter - Picnic Invitations	May 24-28
Orientation/Program Starts	June 7
Technical Lecture - Aeronautics Directorate	June 15
Payday #1	June 18
Picnic	June 18
Technical Lecture - Electronics Directorate	June 22
Technical Lecture - Space Directorate	June 29
Payday #2	July 2
Technical Lecture - Structures Directorate	July 6
Technical Lecture - Flight Systems Directorate	July 13
Payday #3	July 16
Midterm Survey	July 16
Career Conference	July 23

<b>Awards Banquet</b>	<b>July 28</b>
<b>Payday #4</b>	<b>July 30</b>
<b>Final Presentations</b>	<b>August 2-13</b>
<b>Payday #5</b>	<b>August 13</b>
<b>Final Reports Due in UAO</b>	<b>August 9-13</b>
<b>Final Checkout Records Due</b>	<b>Prior to August 13 Payday</b>

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**Agenda**  
**1992 ASEE Summer Faculty Fellowship Program and**  
**Langley Aerospace Research Summer Scholars (LARSS) Program**

**NASA Langley Research Center**  
**H.J.E. Reid Conference Center, Building 1222**  
**Monday, June 1, 1992**

7:30-9:00 a.m.	Registration	
9:00-9:30 a.m.	Welcome	Mr. Edwin J. Prior Acting University Affairs Officer
	Greetings	Dr. H. Lee Beach, Jr. Deputy Director
	Langley Overview	Dr. Michael F. Card Chief Scientist
	Schedule Overview	Mr. Robert L. Yang Assistant University Affairs Officer
9:30-10:00 a.m.	Library Overview	Mr. George J. Roncaglia Technical Library Branch
	Computational Facilities Overview	Dr. Jules J. Lambiotte Analysis and Computation Division
	Mail Room Overview	Ms. Barbara G. Newton Correspondence and Records Management Section
10:00 a.m.	BREAK	
10:10-11:20 a.m.	Cafeteria Overview	Mr. Richard C. Weeks NASA Cafeteria
	Activities Center Overview	Ms. Pamela J. Verniel H.J.E. Reid Conference Center
	Security Briefing	Mr. O. J. Cole Security Office
	Occupational Health Services Overview	Mr. Peter J. Edgette Occupational Health Services Office
	Safety Video	Mr. Clarence F. Breen Safety Management Section
11:20 a.m.	Program Breakout	
12:00 p.m.	Depart for Worksites	

D R A F T

**Langley Aerospace Research Summer  
Scholars (LARSS) Program**

**1992-93**

**Policies,**

**Practices, and**

**Procedures**

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**A Handbook for LARSS Awardees**

## **Introduction**

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As a Langley Aerospace Research Summer Scholars (LARSS) Program participant, you join the ranks of the distinguished summer scholars who have been chosen to participate in the eighth LARSS Program. Since the Program's inception in 1986, the summer research experiences of the LARSS participants have greatly contributed to the scientific efforts of NASA Langley Research Center (LaRC) and to the body of scientific knowledge as a whole.

The LARSS Program was established for the benefit of rising undergraduate juniors and seniors, and first-year graduate students who are pursuing degrees in aeronautical engineering or selected space disciplines of interest to LaRC. The program is intended to encourage high-caliber college students to both pursue and earn graduate degrees and to enhance their interest in aerospace research by exposing them to the professional research resources and facilities of LaRC.

Two primary elements of the LARSS Program are (1) a research project to be completed by each participant under the supervision of a LaRC researcher who will assume the role of a mentor for the summer and (2) technical lectures by prominent engineers and scientists. Additional elements of this program include tours of LaRC wind tunnels, computational facilities, and laboratories. Library and computer facilities will be available for all participants.

The Policies, Practices, and Procedures handbook sets forth the conditions of your award, your responsibilities as a LARSS participant, and the procedures observed by the University Affairs Office (UAO) in supporting and implementing your summer research program. Please retain this handbook for reference during your stay.

# **1    Definitions**

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## **1.1    LARSS Summer Scholar**

As a LARSS Summer Scholar, you are an upcoming undergraduate junior, senior, or first-year graduate student chosen by the UAO or respective Directorate in a national competition, who has been offered an award to perform scholarly research on a problem of interest to NASA LaRC approved for participation in the LARSS Program.

You enjoy the status and privileges of a guest summer scholar at a laboratory. You are not an employee of the LARSS Program or the sponsoring Directorate and do not perform personal services for either organization.

## **1.2    Langley Research Center**

For the purposes of the LARSS Program, the term "Center" is used to refer to NASA's Langley Research Center.

## **1.3    LARSS Mentor**

A LARSS Mentor is the scientist or engineer at a laboratory with whom you will work most closely. All matters relating to your research program will fall under his or her purview. The Mentor also assists as needed in securing space, equipment, or technical and clerical support.

## **1.4    LARSS Program Director**

The LARSS Program Director, the University Affairs Officer or Assistant University Affairs Officer, is responsible for the proper conduct of the program. The name of the Program Director appears at the bottom of your award letter. He is available to discuss any and all aspects of your program with you.

## **1.5 LARSS Program Coordinator**

The LARSS Program Coordinator is a support-staff member of the UAO who is assigned to work closely with the LARSS Program Director. Just as the LARSS Program Director, the Program Coordinator is available to discuss any and all aspects of your program with you and is your prime contact person in the UAO.

## **1.6 Approval**

Throughout this handbook, various procedures are cited that require the approval of the UAO through its' Program Director. The use of the word "approval" means written approval, and any actions taken on the basis of verbal concurrence are not binding on the UAO unless followed by appropriate written authorization.

# **2 Accepting an Award and Beginning Tenure**

## **2.1 Notification of an Award**

You will be notified of your LARSS award by an official award letter that states the primary conditions of your award, information concerning your stipend, and the period of your tenure at NASA Langley Research Center.

## **2.2 Acceptance Form**

Included with your award letter is an Acceptance Form. Use this form to report your decision to accept or decline an award.

If you are requesting a starting or end date that is different from that required starting or end date of the LARSS Program, the approval of both the UAO and the Directorate is required before your tenure may officially begin. These approvals are necessary to ensure compliance with the laboratory's scheduling of research and its availability of support facilities.

Return the completed Acceptance Form to the UAO as soon as possible, but not later than the date specified on your award letter as your offer may be retracted if it is not received by the specified date.

## 2.3 Welcome Package

Also included with your award letter is a Welcome Package. The purpose of this package is to provide you with information which will facilitate your stay at LaRC. Included in this package will be the following:

- (a) Name Check Request, NASA Form 531
- (b) Sample Name Check Request, NASA Form 531
- (c) Security Information Traffic Regulations, NASA LMI 1700.7
- (d) NASA Fact Sheet
- (e) Map of the Area
- (f) Directions to NASA
- (g) Mail Processing Information, NASA LMI 1500.4
- (h) Return Envelope

## 2.4 Working with the Mentor

Maintain close contact with your assigned mentor who will offer guidance in all aspects of your technical activities and assistance in acquiring research support facilities.

## 2.5 Change of LARSS Mentor

If for any reason your assigned LARSS Mentor changes, notify the UAO immediately.

## 2.6 Conforming to Laboratory Policies

LARSS participants are expected to

- (a) conform to all established policies and procedures of the sponsoring laboratory as they pertain to guest researchers;
- (b) observe established guidelines for the safety and health of individuals working in the laboratory, which may preclude unusual hours for conduct of research.

Your mentor will further advise you in these matters.

### **3     Stipend**

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#### **3.1    Stipend   Amount**

The amount of your stipend is shown in your award letter. Stipends are paid on the basis of a 5-day work week and are issued biweekly, beginning the second Friday of the LARSS Program. Therefore, all summer scholars must be prepared to provide for themselves financially the first two weeks of the program before the first stipend check is released. A payroll schedule will be included in the Orientation Packet. The contents of the Orientation Package, which will facilitate your transition to LaRC, are as follows:

To Be Determined

#### **3.2    Acceptance   Form**

The Acceptance Form (Section 2.2), which is included with your award letter, certifies that your tenure will begin on the program starting date and will continue until the date on which tenure officially ends. This form must be received by the UAO before stipend payments are authorized and released.

#### **3.3    Receiving   Stipend   Payments**

Your biweekly stipend payments are not available for deposit by electronic funds transfer (EFT). They must be picked up in person from the appropriate UAO staff member.

In order to receive a stipend payment, your time sheet must be complete and signed by both you and your mentor. Stipend payments cannot be released unless a pictured I.D. and a completed and signed time sheet are turned in.

Final stipend payment will be made only after you have submitted your Final Report, completed the Checkout Record with the appropriate signatures, and any additional required information. If you will not be on the Center the last day when stipend checks are available, a memo to the University Affairs Officer including the address to where you want your paycheck sent, must be written to release your check.

## **4     Insurance**

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### **4.1   Health and Medical Insurance**

It is the responsibility of the LARSS Participant to have the appropriate health and medical insurance coverage. The LARSS Program does not provide any insurance coverage.

Experience has shown that coverage for you and your dependents (if any) is extremely beneficial. Unless you already have insurance coverage, you are advised to weigh carefully the cost/risk factor in reaching a decision to participate in this program.

### **4.2   Worker's-Compensation-Type Insurance [NEEDS TO BE CONFIRMED]**

You are insured by worker's-compensation-type insurance (accident coverage while engaged in normal research activities) under the award. You must immediately report any injury, however slight, that you receive while on duty to your mentor, and the UAO. Medical help is provided in the Clinic-Occupational Health Services Facility. Hours of operation are from 7:00 a.m. to 4:30 p.m. In any medical emergency, dial extension 2222 or go directly to Building 1149.

### **4.3   Automobile Insurance and Driver's License**

You must have a valid driver's license and automobile insurance to be eligible for driving privileges at Langley.

## **5     Taxes**

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### **5.1   Federal Tax Liability of United States Citizens**

Since you are not an employee of NASA LaRC, but are a LARSS summer research scholar, the UAO and sponsoring university do not withhold taxes from stipend payments to you.

You should study the pertinent tax publications; plan ahead to meet any tax obligations, both federal and state; prepare income-tax estimation; make quarterly payments; and file your final returns as required by Federal law.



The responsibility for the payment of your income taxes rests solely with you. The UAO/sponsoring university does not provide information or consultation concerning income taxes.

## 5.2 Social Security

Since you are not an employee of NASA LaRC, but are a LARSS summer research scholar, the UAO and sponsoring university, do not withhold Social Security Taxes from your stipend payments. You should study the pertinent publications on Social Security taxes to determine whether you have incurred any tax obligation.

Although Social Security taxes are not withheld from stipend payments, you are nonetheless required to have an assigned Social Security Number.

## 5.3 State Tax Liability

You may be liable for state income taxes and should file the appropriate tax return in compliance with the laws of the state in which you reside. You should consult a local government tax authority at the beginning of tenure for further details concerning this liability.

# 6 Leave

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## 6.1 Leave

As a guest researcher in the ten-week LARSS Program, you are not eligible for annual leave, sick leave, or personal leave.

If there are reasons why you need any type of leave or absence from work during your summer research experience, write the University Affairs Officer for consideration of requested leave. Approval of the University Affairs Officer and your mentor will be required for requested leave. If such leave is approved, all missed time must be made up.

## 6.2 Working Hours

All LARSS Participants will work an 8-1/2 hour workday, which includes a 30 minute lunch, from one of the following shifts:

- (a) 7:00 a.m. - 3:30 p.m.
- (b) 7:30 a.m. - 4:00 p.m.
- (c) 8:00 a.m. - 4:30 p.m.
- (d) 8:30 a.m. - 5:00 p.m.

## 6.6 Working After Hours

Approval from the appropriate individuals must be obtained prior to any LARSS participant working on Center after regular working hours.

# 7 Housing

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## 7.1 Housing Package

The UAO provides information on short-term leasing to those students who require housing while they are participating in the LARSS Program. Included with your award letter is a Housing Package. Included in this package is the following:

To Be Determined

## 7.2 Housing Request Forms

The Housing Request Form must be submitted by the specified date on the form. If the form is submitted after that date, the UAO is not responsible for providing you with additional assistance. A completed Housing Request form does not finalize the housing assignment. It is the student's responsibility to contact the apartment complex to finalize all housing arrangements. LARSS does not provide financial assistance with security deposits, etc.

## **8     Technical Lecture Series**

### **8.1   Attendance**

Weekly attendance at the ASEE/LARSS Technical Lecture Series is required of all LARSS Participants.

### **8.2   Absence from the Technical Lecture Series**

If there are reasons you will be unable to attend a technical lecture, written notification must be submitted to the University Affairs Officer prior to your absence.

Information from the following has been solicited and will be included in this manual:

## **9     Technical Library**

### **1 0   Analysis and Computation Division**

#### **1 1   Mail Room**

#### **1 2   Cafeteria**

#### **1 3   Activities Center**

#### **1 4   Security**

#### **1 5   Occupational Health Services**

1992

NASA/ASEE Summer Faculty Fellowship Program  
and Langley Aerospace Research Summer Scholars Program

TECHNICAL LECTURE SERIES

Location: Activities Center Auditorium, Bldg. 1222

Time: 10:00 a.m. - 11:00 a.m. - Lecture

11:00 a.m. - 11:15 a.m. - Questions and Answers

<u>DATE</u>	<u>TOPIC</u>	<u>SPEAKER</u>
June 9	High-Performance Computing and Communications	Dr. Thomas Zang Fluid Mechanics Division Aeronautics Directorate
June 16	Looking With New Eyes	Dr. Joseph Heyman Instrument Research Division Electronics Directorate
June 23	Global Warming: Atmospheric and Climatic	Dr. Joel Levine Atmospheric Sciences Division Space Directorate
June 30	Sonic Boom Research	Mr. W. L. Willshire Acoustics Division Structures Directorate
July 7	Wind Shear Research	Dr. Roland Bowles Wind Shear Program Office Flight Systems Directorate

May 28, 1992

**NASA Langley Research Center**

**ASEE Summer Faculty Fellowship Program**

**and**

**Langley Aerospace Research Summer**

**Scholars (LARSS) Program**

**TECHNICAL LECTURE SERIES**

**NEXT LECTURE**

**July 7, 1992**

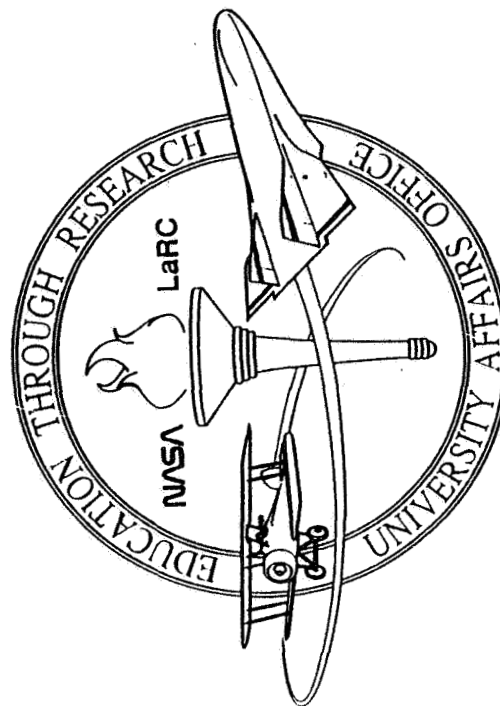
**WIND SHEAR RESEARCH**

**presented by**

**Dr. Roland Bowles**

**Flight Systems Directorate**

**Wind Shear Program Office**



**June 30, 1992**

**Sonic Boom Research**  
presented by  
**William. L. Willshire**  
**Structures Directorate - Acoustics Division**

**Mr. William L. Willshire**

- Graduated from the University of Mississippi in 1975 with a physics degree.
- Studied engineering at the University of Texas-Austin, earning a MSME in 1977.
- Was a research assistant and performed research in the area of nonlinear atmospheric propagation of sound at the Applied Research Laboratory while in graduate school.
- Accepted a research position with Acoustics Division of NASA Langley Research Center upon graduation from the University of Texas.
- Performs basic and applied research in atmospheric propagation of aircraft noise.
- Has authored or co-authored 28 technical papers.

The fact that supersonic aircraft travel faster than the propagating pressure disturbances they create, leads to the topic of sonic booms. A goal of the Langley High Speed Research (HSR) Program is to have an aircraft with an acceptable boom which is economically viable. Overland supersonic flight greatly improves the economics, but will it be acceptable? Sonic boom research has three elements: airplane configuration, acoustic propagation, and sonic boom acceptability. The configuration research is aimed at shaping the airplane to change the shape of the sonic boom so that it will be less annoying. Propagation research is aimed at investigating the influence of turbulence on shaped sonic booms. Sonic boom acceptability research sets goals on sonic boom levels and predicts community exposure and reaction to sonic booms. The results from these three sonic boom research elements should combine to yield an achievable, acceptable, and economically feasible supersonic civil transport.

Airport noise and sonic boom minimization is a clear requirement for a successful aircraft design. The goal is to have the HSCT meet existing federal airport noise regulations. In order to achieve this goal new engines which make 15 to 20 dB less noise than Concord engines must be developed. If this were not challenge enough, the regulated noise levels will most probably be reduced 4 to 6 dB before the High Speed Civil Transport flies!

**TIMELINE FOR LONGITUDINAL STUDY****August 7, 1992**

**The Effects of the Intervention of Mathematics, Science, and Engineering Research Projects, Conducted In Conjunction With Langley Researchers, On LARSS Students' Decision to Pursue or Further Graduate Studies**

<b>NASA Langley Research Center</b>	<b>Hampton University</b>	
<b>LARSS Program Coordinator</b>	<b>Graduate Assistant</b>	
<b>Suzanne Boyd</b>	<b>Cynthia Gore</b>	<b>Status</b>
<hr/>		
Provide roster of students and copies of previous surveys to graduate assistant		Complete
	Develop first draft of Interview Code Sheet	Complete
Finalize and prepare Final Interview Code Sheet		Complete
	Develop first draft of Consent Form	Complete
Finalize and Prepare Consent Form		Complete
	Interview Student Sample	Complete
	Data Analysis (includes developing student profiles)	Complete
Develop and distribute Student Exit Survey		Complete
Report on Student Exit Survey		Due-August 14
Develop and distribute Evaluation of LARSS Participant by Mentor Survey		Complete
Report on Evaluation of LARSS Participant by Mentor Survey		Due-August 17
	Technical Report on study to be included in 1992 LARSS Program Final Report	Due-August 19
1992 LARSS Program Final Report to Dr. Venable		Due-August 21
	Develop Follow-Up Survey to "Determine the Value of the Summer Experience" (Survey '91 students)	Due September 19 to UAO

Distribute Follow-Up Survey Due-October 1

Provide access to DB to print labels,  
provide envelopes and other necessary materials

As Needed

Follow-up Surveys will be  
returned to LaRC

Due October 23

Follow-up phone calls

From October 26-30

Analysis of Data

From November 9-  
December 18

Interim Report to Be Given  
to LaRC

Due December 18

Distribute Follow-Up Survey  
(Survey '92 students)

Distribute-March 1

Follow-Up Surveys will be  
returned to LaRC

Due March 22

Follow-up phone calls

From March 22-26

Analysis of Data

From April 5-April 30

Develop Survey to Assess Long-term  
Effects of the Program

Due-April 30

First Copy of 1992 LARSS Program  
Final Report to UAO

Due-May 21

Final 1992 LARSS Program  
Final Report

Due-May 31



**FINAL DESCRIPTIVE REPORT**

**1992 LANGLEY AEROSPACE RESEARCH SUMMER SCHOLARS PROGRAM  
(LARSS)**

**AUGUST 19, 1992**

In 1986, NASA Langley Research Center (LaRC) established the Langley Aerospace Research Summer Scholars (LARSS) Program. This Program was designed to benefit upcoming undergraduate juniors and seniors as well as first-year graduate students who are pursuing careers in Aerospace disciplines or selected space disciplines of interest to LaRC.

Sponsored by NASA LaRC, in conjunction with Hampton University, this program is designed to motivate high-caliber students to both pursue and earn graduate degrees and to enhance their interest in Aerospace research by exposing them to the professional research resources and facilities of LaRC.

#### PURPOSE

The purpose of this research was to determine whether the intervention with mathematics, science and engineering research projects, at the undergraduate and graduate levels, channel and encourage students to pursue (or further) graduate studies in areas of interest to NASA

#### SUBJECTS

The subjects of this research were approximately 30, randomly-selected students who met the following criteria: a) undergraduate junior; b) undergraduate senior or c) first-year graduate students who are pursuing careers in Aerospace disciplines.

#### METHOD/PROCEDURE

The methods used in this study were two-fold. first, a questionnaire was developed to probe five main points of interest. Since the author wished to investigate Langley Aerospace Research Summer Scholar (LARSS) participant's, questions were first formulated to identify what, if anything, became the influential factor in participant's decision to accept the offer for summer internship.

The questionnaire was then presented to the students in an informal interview. Interviews were conducted by the graduate assistant. Interviews met the following criteria: 15 minute in

length; b) were held in the student's place of work; and c) were audiotaped for reliability and validity.

## RECORDING DATA

Charts, with each question listed at the top, was designed to track responses . Information listed under a question was tallied on the form, including comments (See Charts).

## ANALYZING DATA

The data received was evaluated by dividing the number of responses under YES and NO by the percentage of students..This data consisted of listings and comments and are provided in the Appendix (See Appendix A).

## RESULTS

The results from the study are as follows:

Question 1 Is this your first time participating in the LARSS Program?

This question was intended to focus upon the number of new participants in the summer internship with LaRC. (See Table 1)

Question 2. How certain do you feel the LARSS Program will motivate you to pursue a higher level of education in the Aerospace Discipline?

This question was intended to highlight those students whom were motivated by their active participation in the LARSS Program to pursue a higher level of education in either the Master's or Doctoral level. (See Table 2 )

Question 3. How has your experience at NASA Langley influenced this decision (from question #3?)

To determine if the experience of working in a Federal Laboratory at NASA Langley was a motivational factor in students' decision to pursue higher education, this question was included (See Appendix A).

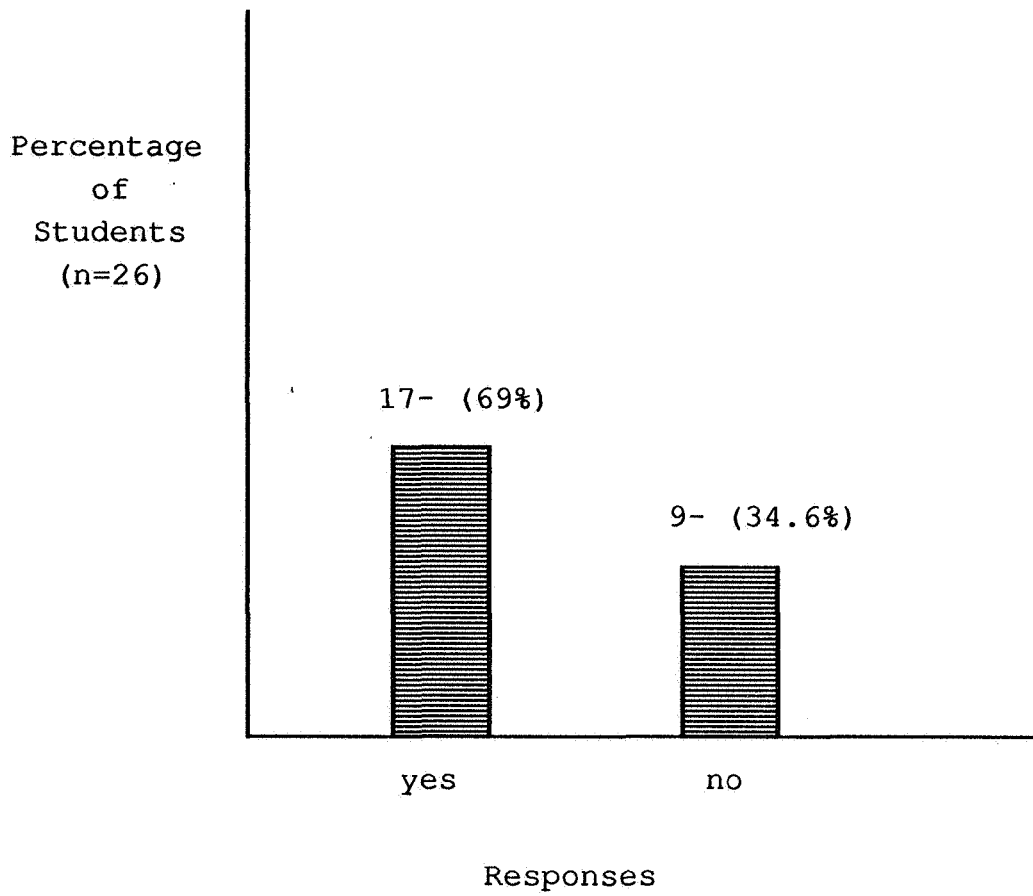
Question 4. Do you feel 10 weeks will be long enough to complete your research project?

This question was designed to seek student's opinions concerning the time period allowed by LaRC to complete research projects. (See Table 3)

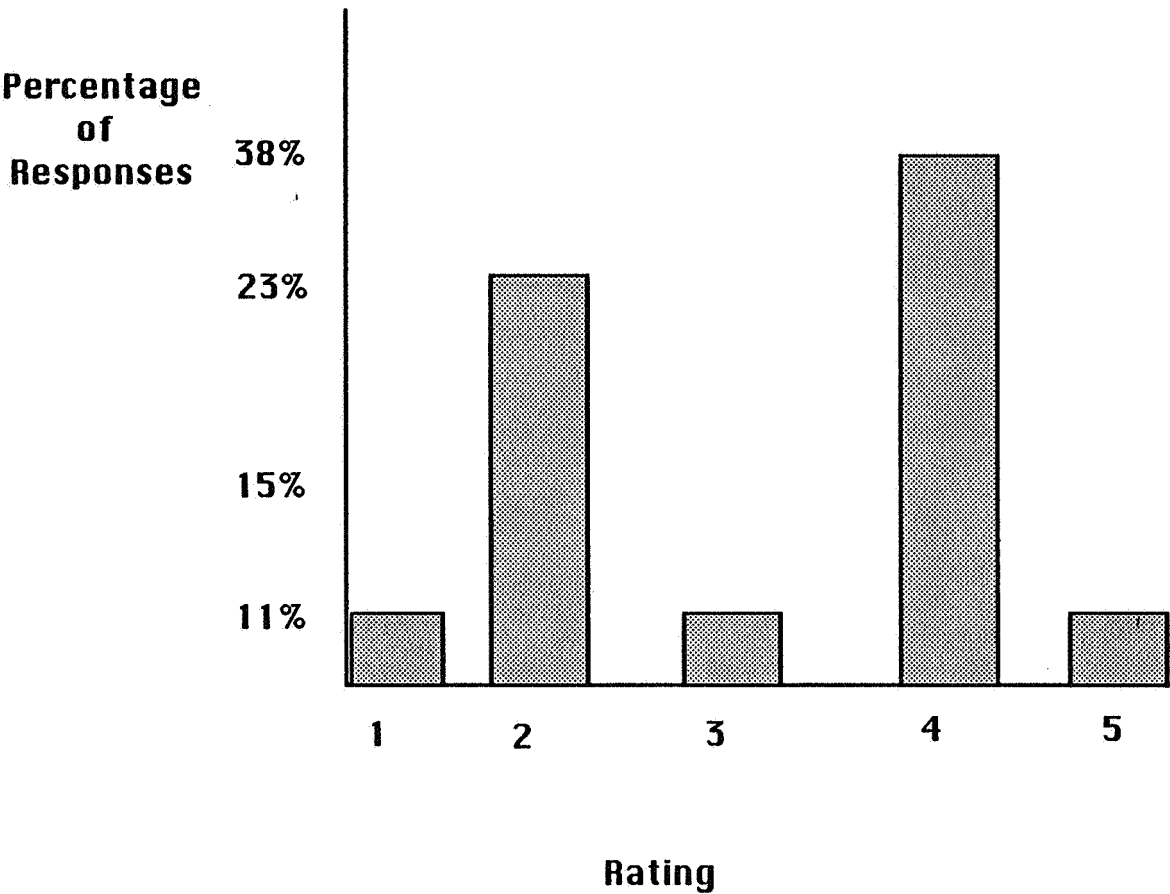
Question 5. Would you like to continue your research at your own institution?

As ongoing research is an important contributor to any scientific field, this question was included to illustrate to what degree students would consider continuing their present research projects. (See Table 4).

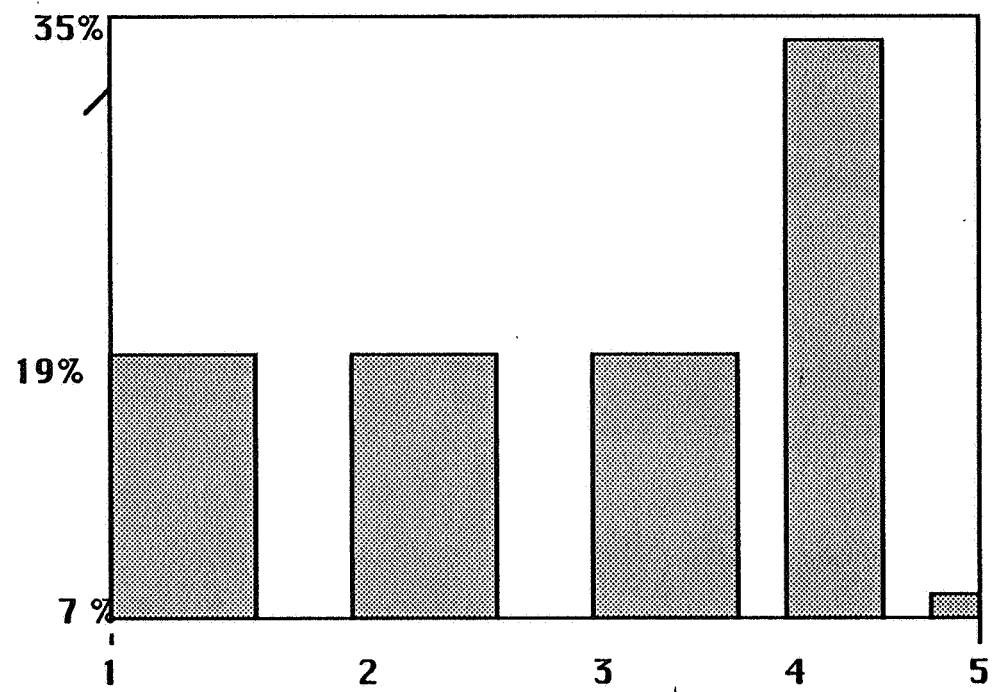
Table 1. Student Participation



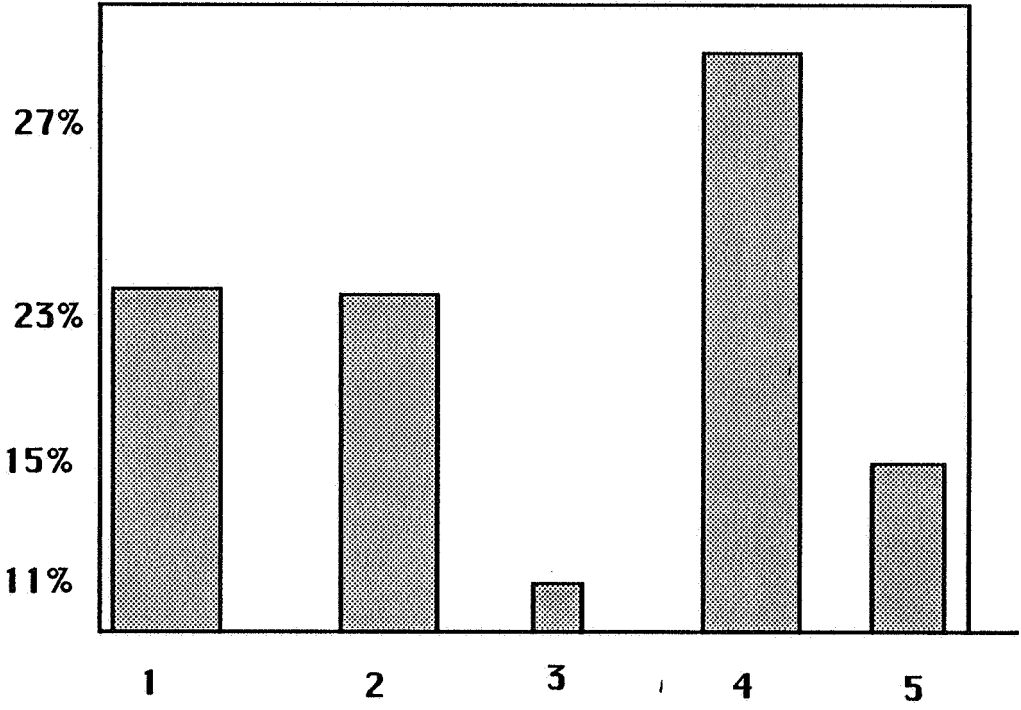
**Table 2. Student's Pursuing Higher Education**



**TABLE 3. STUDENT RESPONSES CONCERNING LENGTH OF PROGRAM.**



**TABLE 4. STUDENT RESPONSES TO CONTINUATION OF RESEARCH**





June 23, 1992

TO: Bob

FROM: Suzanne

SUBJECT: 6/22 Worksite Visit With Chris Cosby (LARSS Student)

Ed and I met with Mr. Cosby and his mentor, Mr. Lightfoot, from 2:00 p.m. until 2:45 p.m. on June 22, 1992. Mr. Cosby is working in the Electronics Directorate, Instrument Research Division. He expressed his experience thus far in the LARSS Program has been challenging and exciting. Mr. Cosby will be graduating from Old Dominion University in the Fall of 1993 with a B.S. in Electrical Engineering and plans to pursue a Master's Degree in Electrical Engineering immediately thereafter. He was accepted to such prestigious universities as MIT, Harvard, Caltech, Duke, and Georgia Tech for his undergraduate work; however, he chose to attend Old Dominion University because they offered him a full academic scholarship. The importance of pursuing the more prestigious universities for his graduate work, as well as the importance of pursuing his Ph.D., were stressed as he had stated he planned to stay at Old Dominion for his Master's Degree. His suggestions for continuous program improvement included the following:

- (1) continue the orientation, possibly adding a tour of the Center, and
- (2) add a few more technical lectures. Mr. Cosby was encouraged to get more information on the GSRP Program for graduate school.

## Researcher News July 2, 1992

### New Faces On Center Are Summer Scholars

■ BY WHITNEY BARTLETT

If you see an unfamiliar face at Langley, it could be one of the 91 students taking part in the Langley Aerospace Research Summer Scholars (LARSS) Program. Or, it could be the face of a summer faculty fellow participating in the American Society for Engineering Education (ASEE) Program.

Every summer a select number of students and educators from colleges and universities across the country, including Hawaii and Puerto Rico, come to the Center to participate in these guest researcher programs.

The 10-week LARSS program was established in 1986

for rising juniors, seniors and first-year graduate students in an effort to motivate science and engineering students to earn advanced degrees and pursue careers in aerospace research. Each scholar conducts a research project under the supervision of a Langley researcher who assumes the role of a mentor.

"This is the most competitive LARSS program since its inception in 1986. The mean G.P.A. of the 1992 scholars is 3.46," said Robert Yang, Assistant University Affairs Officer.

This year, 318 undergraduates and 46 graduate students applied. The 91 scholars

represent 49 colleges and universities.

The ASEE program was established in 1964 as a 10-week summer research program for college and university faculty. One hundred and twenty-three educators applied for an ASEE fellowship and 38 were selected, bringing the total number of participants to date over 5,500.

"We take pride in our collaborative university programs under which high-caliber students and faculty are offered direct participation in our aeronautics and space technology research programs, and one-on-one access to our world class researchers," said Yang.

## Researcher News

July 17, 1992

# LARSS, ASEE Participants Spend Time Researching And Learning

BY WHITNEY BARTLETT

Langley has a total of 91 Langley Aerospace Research Summer Scholars (LARSS) and 38 American Society for Engineering Education (ASEE) Summer Faculty Fellows this summer.

More than half of the LARSS and ASEE participants are working in the Offices of Director for Flight Systems, Structures and Space.

Dr. W. Steven Gray is one of the four ASEE educators in the Office of the Director for Flight Systems. He is working with Donald Soloway, aerospace technologist for robotics research in the Automation Technology Branch.

"We are applying my research experience in nonlinear dynamical systems to determine how a neural network can be used reliably in a control application," Gray said.

Gray has been a professor at Drexel University in Philadelphia for three years. The Saint Davids, Penn. resident received his doctorate from Georgia Institute of Technology in Atlanta.

This is Soloway's first time working with an educator in the ASEE program. His research interests include the fundamentals of neural networks for controls. He came to Langley in 1980 as a co-op and became a NASA employee in 1982.

Jose L. Maldonado-Salgado is one of the 13 LARSS students in Flight Systems. He is working under Robert L. Jones, aerospace technologist for the Information Processing Technology Branch.

Maldonado-Salgado's research includes the investigation through literature searches and experimenting the behavior of data dependent on algorithms

executed in Algorithm to Architecture Mapping Model-based systems.

"Jose's experimental results are intended to lead to theories about the statistical behavior of the performance metrics which are characterized by random variables," Jones said.

Maldonado-Salgado has a bachelor of science degree in computer engineering from the University of Puerto Rico. "I'm not used to the cool air here," he said when temperatures were in the 70's. He will attend George Washington University to earn a master's degree in aeronautics and controls.

Jones has worked at Langley for two years. He has several duties including, aiding in the development and implementation of operating systems and the characterization of their performance on various multicomputer architectures.

Andrea L. Schmidt is a LARSS student who is doing research in the Office of Director for Space. There are 18 students in this directorate.

"I am studying how the crew aboard the Mars Transport Vehicle (MTV) will be effected by radiation," Schmidt said. The MTV's first scheduled mission is in 2014.

Schmidt's mentor is Lisa C. Simonsen, an aerospace engineer in the Vehicle Analysis Branch. Simonsen's research includes human factors engineering and radiation shielding.

A rising senior at Kansas State University, she is majoring in mechanical engineering.

Dr. Fazley B. Malik is one of the five ASEE educators in the Space Directorate. He is a physics professor at Southern Illinois University at Carbondale. Malik is researching



Jose L. Salgado

Photos by Fred Jones and Mary Beth Payne



Henry E. Lippard

how the instruments and crew are affected by the radiation that penetrates the shields on spacecraft.

Dr. Lawrence W. Townsend, senior research scientist of the High Energy Science Branch, is working with Malik. This is Townsend's third time working with an ASEE Summer Faculty Fellow. His research includes the study of galactic cosmic rays and radiation in space.

A native of Bankura, India, Malik received his doctorate in



Andrea L. Schmidt

physics with professor Heisenberg at the University of Gottingen in Germany.

The Office of Director for Structures has 23 LARSS and 12 ASEE participants, more than the any other directorate.

Dr. David Dillard is one of the ASEE participants. He is working with Dr. Terry L. St. Clair and Dr. W. Steve Johnson. They are researching high temperature adhesives for

Please see **PROGRAM** page 3

## Researcher News

### July 17, 1992

#### PROGRAM:

*Continued from Page 1*

polymers to be used on the High Speed Civil Transport (HSCT).

"The HSCT is expected to reach a maximum speed between Mach 2.0 and 2.4, which could see a temperature as high as 400 degrees Fahrenheit," Dillard said.

St. Clair is head of the Polymaterials Branch and has worked with several ASEE educators. He has been at Langley since 1972.

Johnson is the senior scientist for the Mechanics of Materials Branch. He has been a NASA employee since 1979 and is a team leader for the National Aero-Space Plane program.

Henry E. Lippard is one of the 23 LARSS students in the Office of Structures. He is working with Dr. Stephen J. Hales, an employee of Analytical Services and Materials, Inc. The two are studying the formation of superplastics of aluminum-lithium alloys for use on National Launch Systems.

Lippard's mentor is John A. Wagner, materials engineer for the Metallic Materials Branch. Wagner has been a NASA employee since 1983. He is responsible for coordinating activities for the innovative processing of advanced materials.

"This is my third summer as a LARSS student. I have informed other students at my



Dr. W. Steven Gray

*Photos by Fred Jones and Mary Beth Payne*



Dr. David A. Dillard

university about the LARSS program, and now there are five from N. C. State in this directorate," Lippard said.

Having earned his bachelor's



Dr. Fazley B. Malik

degree in materials sciences from North Carolina State University, Lippard plans to enter graduate school this fall at Northwestern University in Illinois.

## Scholars And Fellows Learn About Langley LARSS, ASEE Participants At Work In All Directorates

■ BY WHITNEY BARTLETT

There are 33 Langley Aerospace Research Summer Scholars (LARSS) and 16 American Society for Engineering Education (ASEE) fellows working in the Offices of the Directorates for Systems Engineering & Operations, Management Operations, Aeronautics and Electronics.

The head of the Aeronautical Engineering Section, Allen C. Royal in the Systems Engineering & Operations Directorate, is acting as a mentor for LARSS participant Heather F. Hayden. The rising senior is majoring in aerospace engineering at Virginia Polytechnic Institute and State University. Hayden



Heather Hayden

worked in the same section last summer with Royal.

One of the projects Hayden

is working on is the OV-10A Wake-Vortex Flight Project. This project involves the detection of an aircraft's vortex.

"NASA researchers are trying to find a way smaller aircraft can identify the vortex of a larger airplane so they will not get pulled into it," said Royal.

Booms will be attached to the wings of the OV-10A, which will aid in the experimentation of vortex detection. "I am working on an instrumentation pallet, which will read the OV-10A test results," said Hayden.

Royal came to Langley in December of 1987. Two years ago he assumed the role as a section head.

David Johnson is an ASEE fellow working in the Electronic Systems Branch with the group leader for the imaging and Computer Aided Design and Drafting (CADD) projects, W. Brad Ball.

Ball was Johnson's ASEE associate last summer. "This summer we're looking at advanced information systems interfacing-especially virtual reality, and identifying applications across Langley that will service a demonstration project," Johnson said. His man-utilization project from last summer is currently in systems development for the Facilities Engineering Division.



Photo by Fred Jones

David Johnson, left, and Robert Gage are working with virtual reality systems. Johnson is an ASEE fellow.

Please see **FELLOWS**, Page 6

## Researcher News July 31, 1992



Photo by Whitney Bartlett  
Sherilee Beam is working in the Electronics Directorate as an ASEE fellow.



Photo by Fred Jones  
Denise F. Hamlin is a photographer.

### FELLOWS:

(Continued from Page 1)

Johnson teaches management and information systems courses at St. Paul's College in Lawrenceville, Va. He has a master's degree in industrial engineering and operative research from VPI and a master's in business administration from Virginia Commonwealth University. Johnson received a bachelor of science degree in physics and computer science from Randolph Macon College.

The Aeronautics Directorate ranks third in having the greatest number of ASEE participants and LARSS students. ASEE participant Dr. Chivey Wu is working in the High Reynolds-Number Aerodynamics Branch with his associate



Photo by Whitney Bartlett  
Lori L. Heustess is working with Sherilee Beam in Electronics.

Lawrence E. Putnam, branch head.

"Dr. Wu is using applied CFD (computational fluid dynamics) to compute the effect of Reynolds number and the leading-edge radius of the vortical flow over a 65 degree delta wing configuration," said Putnam.

Wu is a mechanical engineering professor at California State University in Los Angeles. He has a master's in mechanical engineering from the University of Illinois and a bachelor's degree from Cheng Kung University in Taiwan.

Putnam came to Langley in 1959. He has worked in a number of wind tunnels including his present position at the National Transonic Facility.

LARSS student Alexander M. Benoitel is working with Zachary T. Applin in the Subsonic Aerodynamics Branch, Aeronautics Directorate.

"Alex has been doing programming for us to help with the data reduction and analysis from a transport model currently being tested," Applin said.

Benoitel is also working on a NASA report with Applin on the transport model testing.

Benoitel majored in aerospace engineering at VPI and plans to attend graduate school in the fall.

Applin has been a Langley employee for 13 years. He is responsible for conducting wind tunnel research on civilian transport aircraft, propulsion integration activities, high-lift aerodynamics and CFD.

ASEE fellow Robert L. Tureman, an assistant professor of management information systems for Paul D. Camp Community College, is working in the Human Resource Management Division (HRMD) for the Management Operations Directorate.

"We're doing a variety of computer-related tasks. All of them are related to more effectively using personal computers and the information that they have," said Tureman.

"The main project that I am working on is personal computer productivity—

information and then extracting information from the main frame to the personal computer. Therefore, they can become more productive in meeting special assignments and special projects they might have."

Tureman has a master's and a bachelor of science degree in computer science from Old Dominion University. His associate is James Meyers, personnel management specialist in the Human Resources Management Division. This is his first time as an ASEE associate since he began working at Langley in 1975.

LARSS student Denise Hamlin works in the Management Operations Directorate. She works in the photographs section with her mentor, Alton T. Moore. Her current project involves photographing the students who are involved in university programs at Langley.

"I'm hoping my research project will unfold into a yearbook," said Hamlin.

Hamlin has a bachelor of arts in mass media from Hampton University. She participated in the LARSS program last year and worked in the video section. Hamlin comments on what she is learning this summer.

"I'm learning how things can look differently—as opposed to when you are standing right there with the photographer when he is taking the picture and then



Photo by Whitney Bartlett  
Robert L. Tureman is spending time this summer in the Human Resource Management Division.

when you see it in a still photo," Hamlin said.

Moore, who came to Langley in October of 1955, is now head of the photographs section.

LARSS student Lori L. Heustess and ASEE participant Sherilee Beam are working in the Electronics Directorate.

Dr. Patrick H. Johnston, group leader for ultrasonics in the Nondestructive Evaluation Sciences Branch, is Heustess' mentor.

### Intelligent sound

"We want to learn how to generate sound intelligently and detect it intelligently, and be able to put ultra sound into materials in a way that is useful."

"We are trying to understand the physics of the theoretical and the experimental of the generation and the detection of ultra sound propagation and interaction of ultra sound with complex materials like fiber reinforcements composites," said Johnston.

Johnston came to Langley six years ago as a contractor for Analytical Services and Materials Inc.

Heustess is attending graduate school at the University of New Mexico.

Beam is working on a project about high speed research in a joint effort with

the scientific visualization lab.

"It is going to be a technical video report, which will encompass live video interviews, showing researchers at work as well as collecting some of their data visualization and animation through the system here and putting it together using the personnel here," she said.

Beam teaches video production at Hampton University. She has a master's in instruction media and television and film from Westchester University in Pennsylvania and a bachelor's degree from Mansfield University in Spanish and English.

Her ASEE associate Bill Von Offenheim is pursuing a doctorate degree in computer science from the College of William and Mary. Von Offenheim came to Langley in 1981. He is working in the data visualization and animation lab in the Flight Software and Graphics Branch.



Photo by Fred Jones  
Alexander M. Benoitel works on a wind tunnel transport model.



Photo by Whitney Bartlett  
Dr. Chivey Wu is working with computerized fluid dynamics.

Langley Aerospace Research Summer Scholars Program  
**YOU NAME IT LARSS NEWSLETTER**

August 1992, Issue 1

**Anyone for a Bag of Rice?**

by Stephen P. Lukachko  
 University of Michigan

I walked into that conference center nervous. "This is like taking the GRE", I thought smiling to myself. Working for the force behind Apollo does not exactly lay the heart to ease. In fact, when I found out that I was going to work for the Space Exploration Initiative Office a few weeks back...well, I opened up a book and started studying. Geek? Well sure I am, but in my mind, there is a lot to be said about being prepared. So, I came expecting to program trajectories for lunar and Mars mission scenarios.

My mentor walked up to me while the mentors were being paired up with students and said, "Stephen? Davy Haynes," with an extended hand.

"Yes, that's me...hi, how are you?", shaking his hand.

"Fine. There has been a change of plans though. I'm no longer going to be your mentor..."

And so my summer began. My mentor did change and charged me with the task of producing a baseline study on the layout, control, and detection schemes of a lunar interferometer; an array of optical telescopes on the Moon. I've graduated with an aerospace engineering degree and I have one more term to go in my mechanical engineering degree before I head to grad school. Putting aerospace and mechanical engineering in the same bag with optics gave me my first lesson: be prepared to delve deeply into aspects of other fields. Over these 10 weeks, I've stepped into specifics of electrical engineering, optics and other physics-related subjects, radiometry, all kinds of astronomical fields, and even dabbled into policy (the library is going to hunt me down...). On top of that, there has been the experience of being in an office that is working on a lunar rover and a concept for aerobraking; and where there is always a good crop of routings to read about everything else to do with space exploration. And then there was living in the hotel-like atmosphere of Oakwood Apartments (I'm not sure whether that is good or bad...), and going on day trips on the weekends, and making my first apple pie, or should I say, creating a BIG mess...

So, yeah, you should know that it's been a great experience, but I have one problem left...does anyone want any of my food so I don't have to cart it home? Just wondering...



**Hands-On**

by Melissa A. Long  
 Clemson University

As a LARSS student, I have gained "hands-on" experience in ceramics that I had not obtained while attending college. The lab work was with a novel slip casting technique for ceramics called the Lost Wax Technique. With this recently developed method of casting, fellow workers and I fabricated complex ceramic designs to be used on optical benches.

The LARSS program was rewarding, and from the work accomplished in the NASA LaRC labs, I was able to write 3 technical memos, abstracts for ACS, several patent disclosures, and possible tech briefs.



**LARSS Participation**

by Kimberly J. Wells  
 North Carolina State University

As a participant in this year's LARSS program, I have acquired many positive attributes that will prove to be beneficial to my career. With a major in Industrial Technology/Manufacturing, I received the opportunity to gain and apply practical knowledge to research in my field of study. The weekly seminars contributed, too. They provided interesting information on technology and its' advances in the aeronautics industry. The positive and open work environment made it easier for me to adjust to my new surroundings. The recreational activities that were planned gave me the opportunity to get to know the other students and have some fun. This internship was more than a working experience, it was a learning experience. I can honestly say that the experience gained from this program has challenged me to set and achieve higher goals for myself and my career. I have had a wonderful summer experience and I count it as an honor and privilege to have been accepted to such a highly regarded program.



**LARSS Program Highlights for  
 the Summer of 1992**

by Alexander M. Benoliel  
 Virginia Polytechnic Institute & State University

This summer I was involved in a continuing research project of a generic tactical transport (GTT) model being tested in the Langley 14- by 22 Foot Subsonic Tunnel. In particular, I was involved in the data reduction and analysis of a test completed



on this model in March of 1992. I developed several software packages to aid in the presentation and evaluation of the pressure data and to compare the pressure data with the strain gauge balance data from the same test. An in-depth analysis of the pressure data was done with the intent to contribute to the overall report of this test which will be submitted by the test engineers of this project. Analysis of the data not only involved writing special codes to present particularly important parts of the data, but also included extensive research of previous work done on multi-element flaps by other researchers and application of aerodynamic theories that resulted in meaningful conclusions.

♣♦♥♣

**Analytical Study of the Effects of  
Floor Location on Response of  
Composite Fuselage Frames**  
by Cynthia Holland

North Carolina Agricultural & Technical State  
University

An understanding of how conventional structures fail is often required in the process of designing new and more crashworthy structures. The subfloor crushable structure in aircraft has often been cited as an important aspect in minimizing vertical crash accelerations because of their capabilities in absorbing energy. Although full-scale dynamic testing of aircraft structure is desirable, and often must be performed in the final stages of design; considerable information can be acquired from simple plastic static testing. Consequently, destructive static testing of a semi-circular composite frame with different floor positions, simulated by a horizontal beam attached at three different levels (180, 120, and 90 degree positions), was undertaken to study the strain distribution and stiffness. Intentions were to fail the specimen to find where the highest strains occur; hence, pinpointing where failures are likely to occur.

♣♦♥♣

**My LARSS Experience**  
by Christine M. Vogel  
University of Notre Dame

Through participation in the LARSS Program, I have learned a great deal about my field of studies and myself. I am an aerospace engineering major and through my project, I was exposed to some of the most powerful computational fluid dynamics studies in the field of hypersonic aerodynamics. The experience I have gained in working with graphics software on high-powered computer systems will prove invaluable for my future career. Receiving acceptance into this program is almost a dream come true for a girl who has always been fascinated by the stars and dreamed of becoming an astronaut. I plan to continue my studies in graduate school and many people have told me that some prior technical experience would help me when applying. Thus, I

came into this program with the goal of gaining some technical experience before I graduate with my bachelor's degree. What I have gained is a taste of working with a group of professionals who respect each other and are always communicating their ideas and asking questions. I now have experience living out on my own with the responsibilities of making payments and providing for myself. I have learned about many areas of the field of aerospace which will help me choose my area of graduate studies. I have made some valuable contacts in the technical world and many new friends. Virginia is a beautiful place to live, work, and play. I could not think of a better way to spend my summer. Thanks for the opportunity.

♣♦♥♣

**FAREWELL...**  
by Suzanne Boyd

As a former LARSS participant and this year's LARSS Program Coordinator, I congratulate each of you on your participation in the LARSS Program. I wish you success in your future endeavors and hope that the time you have spent as a LARSS participant has been beneficial to you. You should expect to hear from the University Affairs Office from time-to-time as we follow your career developments. Good luck to each of you in the upcoming academic year!

♣♦♥♣

**Contributors**

Stephen P. Lukachko  
..... University of Michigan  
Melissa A. Long  
..... Clemson University  
Kimberly J. Wells  
.... North Carolina State University  
Alexander M. Benoliel  
.. Virginia Polytechnical Institute &  
..... State University  
Cynthia L. Holland  
..... North Carolina Agricultural &  
..... Technical State University  
Christine M. Vogel  
..... University of Notre Dame



## 1992 LARSS FINAL REPORT FORMAT

The final report is not to exceed three pages in length (including the cover sheet) and is to be single-spaced, typed, and paginated. Four copies of the final report should be returned to Suzanne Boyd, Bldg. 1312, Rm. 102, prior to receiving your final paycheck on Friday, August 7, 1992.

The technical report is to include the following:

### Part I:

- A. Cover Sheet
  - 1. Topic of Research
  - 2. Student's Name
  - 3. Mentor's Name
  - 4. Directorate, Division, Branch, Office
  - 5. Date of Submission
- B. Abstract
- C. Introduction/Background information
- D. Summary of Research
  - Briefly discuss the following:
    - 1. Approach
    - 2. Equipment and facilities used
    - 3. Results
- E. Conclusion

### Part II:

Please briefly discuss how your summer research experience has contributed to NASA Langley Research Center

**1992**  
**LANGLEY AEROSPACE RESEARCH SUMMER SCHOLARS**  
**(LARSS) PROGRAM ORIENTATION EVALUATION REPORT**

**Submitted to: Mr. Robert L. Yang**  
**Assistant University Affairs Officer**  
**NASA Langley Research Center**

**Dr. Demetrius D. Venable**  
**Vice President for Research &**  
**Dean of the Graduate College**  
**Hampton University**

**June 14, 1992**

**Submitted and prepared by:**

**Ms. Suzanne Boyd**  
**1992 LARSS Program Coordinator**

## **PREFACE**

The purpose of the 1992 LARSS Program Orientation is to provide LARSS Program participants with pertinent information regarding NASA Langley Research Center (LaRC) to facilitate their 10-week stay at the Center. In order to evaluate the effectiveness of the orientation, the 1992 LARSS Orientation Evaluation was developed to serve as a tool to identify which of the following five areas need closer examination: (1) Overall Organization, (2) Pre-conference Notification, (3) Information and Knowledge Gained at the Orientation, (4) Program Breakout Session, and (5) General Rating of the Orientation. This evaluation is also used as a tool to follow with NASA's goal of "continuous improvement". That is, by critically examining the five aspects of the orientation from an objective viewpoint, the appropriate changes can be implemented or made within the LARSS Program. Following are the results of the 1992 LARSS Program Orientation Evaluation, recommendations for the 1993 LARSS Program Orientation Evaluation, and a summary.

## RESULTS

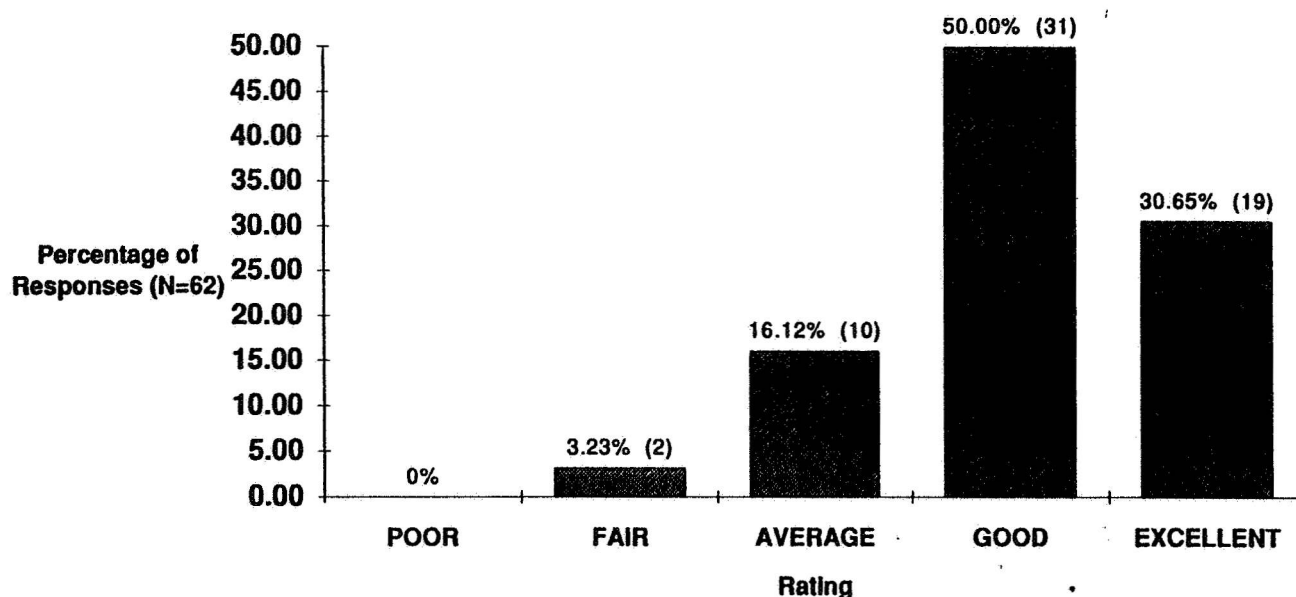
Sixty-two of the 91 surveys distributed on the day of the orientation were returned, thus yielding a return rate of approximately 66%. The five areas addressed in the survey are as follows: (1) Overall Organization, (2) Pre-conference Notification, (3) Information and Knowledge Gained at the Orientation, (4) Program Breakout Session, and (5) General Rating of the Orientation.

### A. Overall Organization

Eighty-one percent of the respondents rated the overall organization of the orientation as either good or excellent and 16% rated it as average. The comments from the respondents in terms of overall organization are as follows: (1) "checking in was very smooth" and (2) "check in flowed well and the format was efficient."

Table 1. Overall Organization

## OVERALL ORGANIZATION

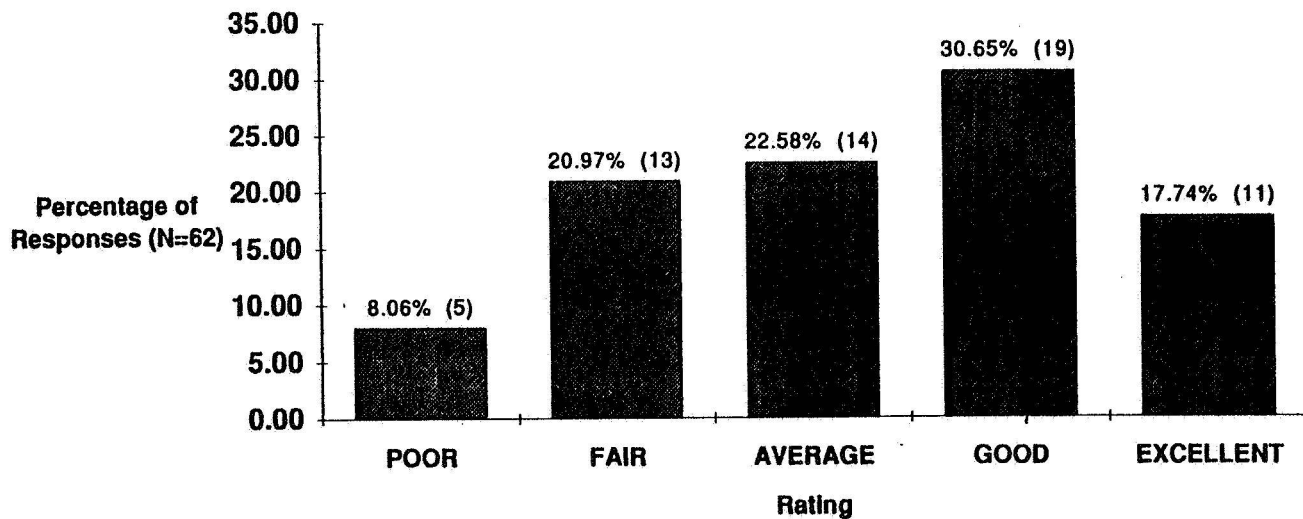


## B. Pre-conference Notification

Seventy-five percent of the respondents rated the pre-conference notification as fair, average, or good, while only 18% rated it as excellent and 8% rated it as poor. The following comments of the respondents in terms of Pre-conference Notification are as follows: (1) "notify students of mentor and research area assignment in advance", (2) "housing notification was poor", (3) "notifications need to be done earlier; some students received forms that were due at NASA Langley two days earlier", and (4) "do not send notifications during exam period".

Table 2. Pre-conference Notification

# PRE-CONFERENCE NOTIFICATION

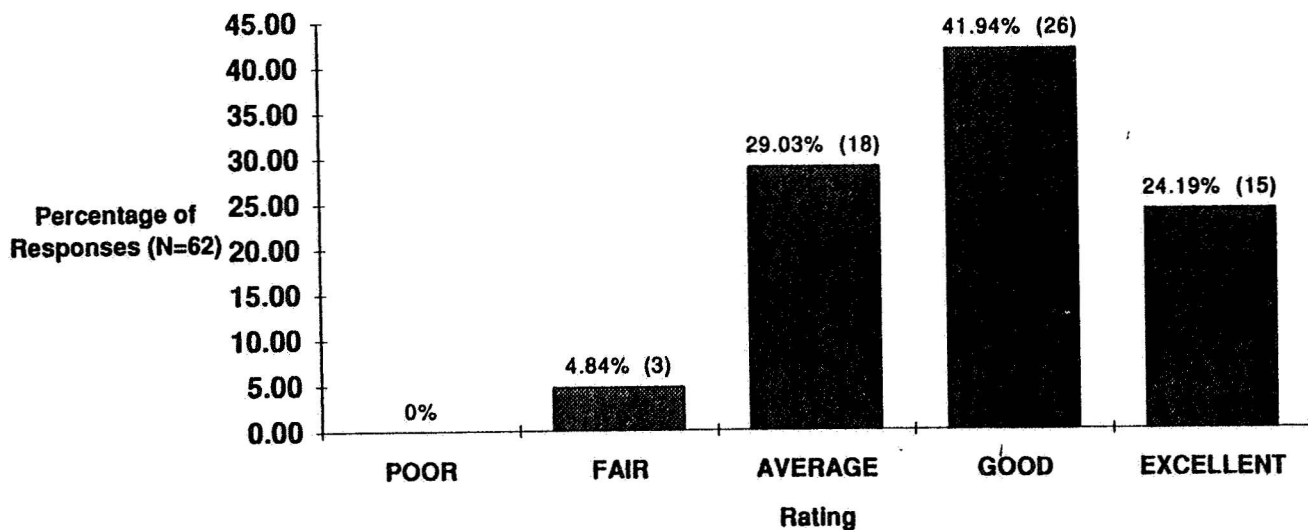


### C. Information and Knowledge Gained

Sixty-five percent of the respondents rated the information and knowledge gained at this orientation as good or excellent, while 29% rated it as average and only 4% rated it as fair. The following comments of the respondents in terms of information and knowledge gained at the orientation are as follows: (1) "some information could have been presented in a briefer manner", (2) "some information could have been reading material only and not presented at all", (3) "need walking/bus tours of NASA LaRC", and (4) "limit presentation times of speakers".

Table 3. Information and Knowledge Gained

## INFORMATION AND KNOWLEDGE GAINED

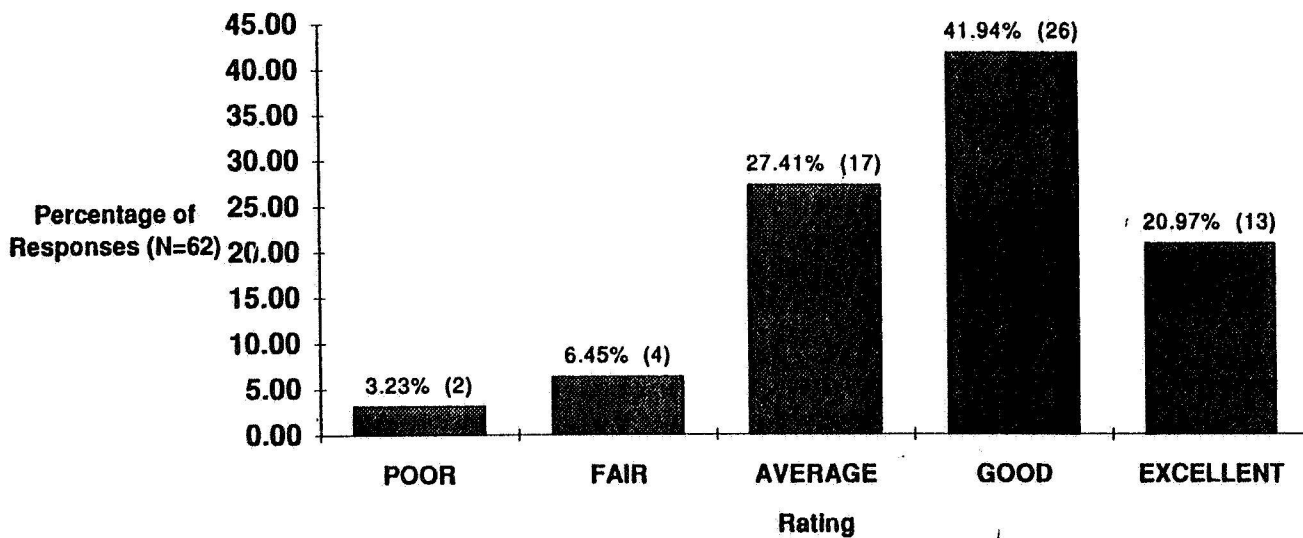


#### D. Program Breakout Session

Only 10% of the respondents rated the program breakout session as poor or fair; while 90% rated it as average, good, or excellent. The following comments of the respondents in terms of the Program Breakout Session are as follows: (1) "introductions of UAO staff helpful", (2) "good idea to have students introduce themselves", (3) "information discussed was very useful", and (4) "cold tone of LARSS coordinators".

Table 4. Program Breakout Session

## PROGRAM BREAKOUT SESSION





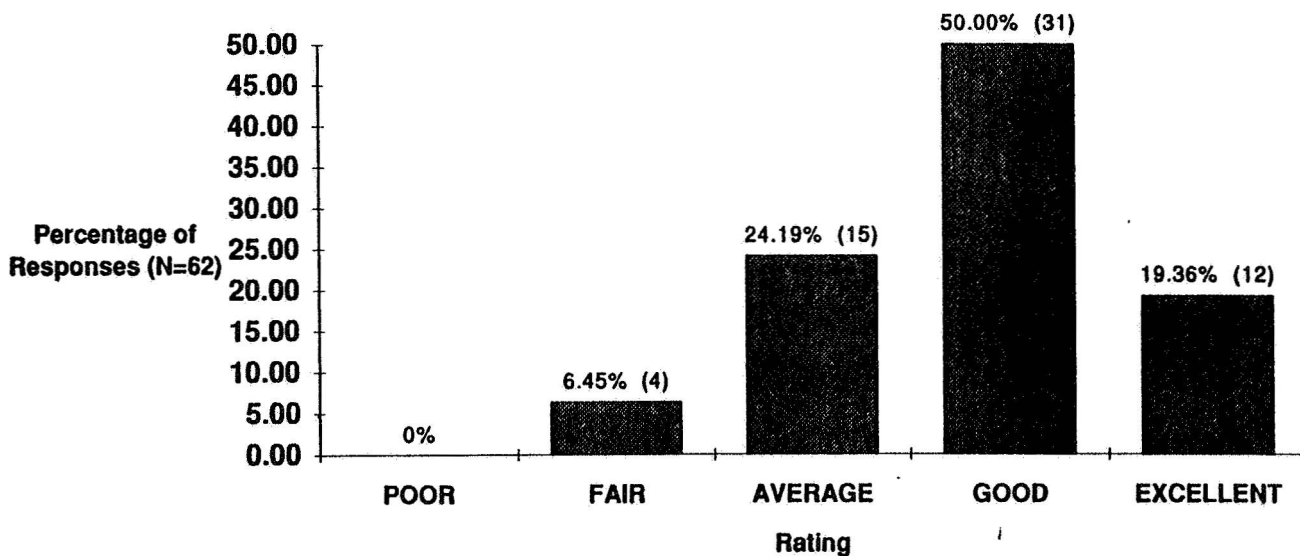


### E. General Rating of the Orientation

No respondents generally rated the orientation as poor and only 6.5% rated it as fair; thus, leaving 93% of the respondents with a beneficial rating of the orientation. The following comments of the respondents in terms of the general rating of the orientation are as follows: (1) "overall organization was great" and (2) "arrange lunch for students and mentors so they can "bond".

Table 5. General Rating of the Orientation

## GENERAL RATING OF ORIENTATION



## **RECOMMENDATIONS**

Based on the results of the 1992 LARSS Orientation Evaluation, the following recommendations are made for the 1993 LARSS Orientation:

- (1) continue to send the NASA 531 security form with the welcome package; this reduces the amount of time to process the student's paperwork;
- (2) if possible, notify student of assigned mentor and work area before arrival to the Center (even though this may change);
- (3) housing information needs to be included in the welcome packet and the acceptance form mailing to ensure that the student receives the housing assignment in a timely manner;
- (4) locate students in the same apartment complex (or same two or three complexes) to decrease a sense of 'isolation';
- (5) revise timeline to reflect date changes which ensure correspondence is sent in a more timely manner;
- (6) limit presenters time at the orientation to no more than 12 minutes;
- (7) arrange bus or walking tours of the Center during the first two weeks of the program; and
- (8) continue introductions of the UAO staff as well as of the students and mentors.

## **SUMMARY**

The overall organization of the 1992 LARSS Program Orientation, as well as the general rating of the orientation, yielded favorable comments from the majority of the respondents. Thus, these two areas are not of major concern at this time. Similarly, the overwhelming majority of the respondents rated the program breakout session highly. Hence, the overall organization of the orientation, as well as that of the program breakout session will remain the same, with suggestions welcomed for future orientations. The information and knowledge gained at the orientation was rated as beneficial by 95% of the respondents and appears to facilitate the student's transition to LaRC. Even though four of the five areas addressed in the survey were rated favorably overall, the one area which reflects an inherent weakness is the pre-conference notification. Close examination of the comments made by the respondents reflect that correspondence and notification must be done in a more timely manner in the future. This orientation evaluation is reflective of both the strengths and weaknesses of the 1992 LARSS Orientation, as well as some general elements of the LARSS Program, like timeliness of correspondence. The recommendations made will ensure a more successful and improved 1993 LARSS Orientation and overall program.

## 1992 LARSS PROGRAM ORIENTATION EVALUATION

Please rate each area on a scale of 1 to 5 with 5 being the highest possible rating. Any comments you wish to add will be appreciated.

A	OVERALL ORGANIZATION	1	2	3	4	5
		Poor	Fair	Average	Good	Excellent

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

B.	PRE-CONFERENCE NOTIFICATION	1	2	3	4	5
		Poor	Fair	Average	Good	Excellent

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

C.	INFORMATION AND KNOWLEDGE GAINED AT THE ORIENTATION	1	2	3	4	5
		Poor	Fair	Average	Good	Excellent

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

D.	PROGRAM BREAKOUT SESSION	1	2	3	4	5
		Poor	Fair	Average	Good	Excellent

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

E	IN GENERAL HOW DO YOU RATE THIS ORIENTATION	1	2	3	4	5
		Poor	Fair	Average	Good	Excellent

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Please use the space below for overall comments, suggested changes or improvements: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Agenda**  
**1992 ASEE Summer Faculty Fellowship Program and**  
**Langley Aerospace Research Summer Scholars (LARSS) Program**

**NASA Langley Research Center**  
**H.J.E. Reid Conference Center, Building 1222**  
**Monday, June 1, 1992**

7:30-9:00 a.m.	Registration	
9:00-9:30 a.m.	Welcome	Mr. Edwin J. Prior Acting University Affairs Officer
	Greetings	Dr. H. Lee Beach, Jr. Deputy Director
	Langley Overview	Dr. Michael F. Card Chief Scientist
	Schedule Overview	Mr. Robert L. Yang Assistant University Affairs Officer
9:30-10:00 a.m.	Library Overview	Mr. George J. Roncaglia Technical Library Branch
	Computational Facilities Overview	Dr. Jules J. Lambiotte Analysis and Computation Division
	Mail Room Overview	Ms. Barbara G. Newton Correspondence and Records Management Section
10:00 a.m.	BREAK	
10:10-11:20 a.m.	Cafeteria Overview	Mr. Richard C. Weeks NASA Cafeteria
	Activities Center Overview	Ms. Pamela J. Verniel H.J.E. Reid Conference Center
	Security Briefing	Mr. O. J. Cole Security Office
	Occupational Health Services Overview	Mr. Peter J. Edgette Occupational Health Services Office
	Safety Video	Mr. Clarence F. Breen Safety Management Section
11:20 a.m.	Program Breakout	
12:00 p.m.	Depart for Worksites	

**1992**

**LANGLEY AEROSPACE RESEARCH SUMMER SCHOLARS  
(LARSS) PROGRAM STUDENT EXIT SURVEY REPORT**

**Submitted to: Mr. Robert L. Yang  
Assistant University Affairs Officer  
NASA Langley Research Center**

**Dr. Demetrius D. Venable  
Vice President for Research &  
Dean of the Graduate College  
Hampton University**

**August 14, 1992**

**Submitted and prepared by:**

**Ms. Suzanne Boyd  
1992 LARSS Program Coordinator**

## **PREFACE**

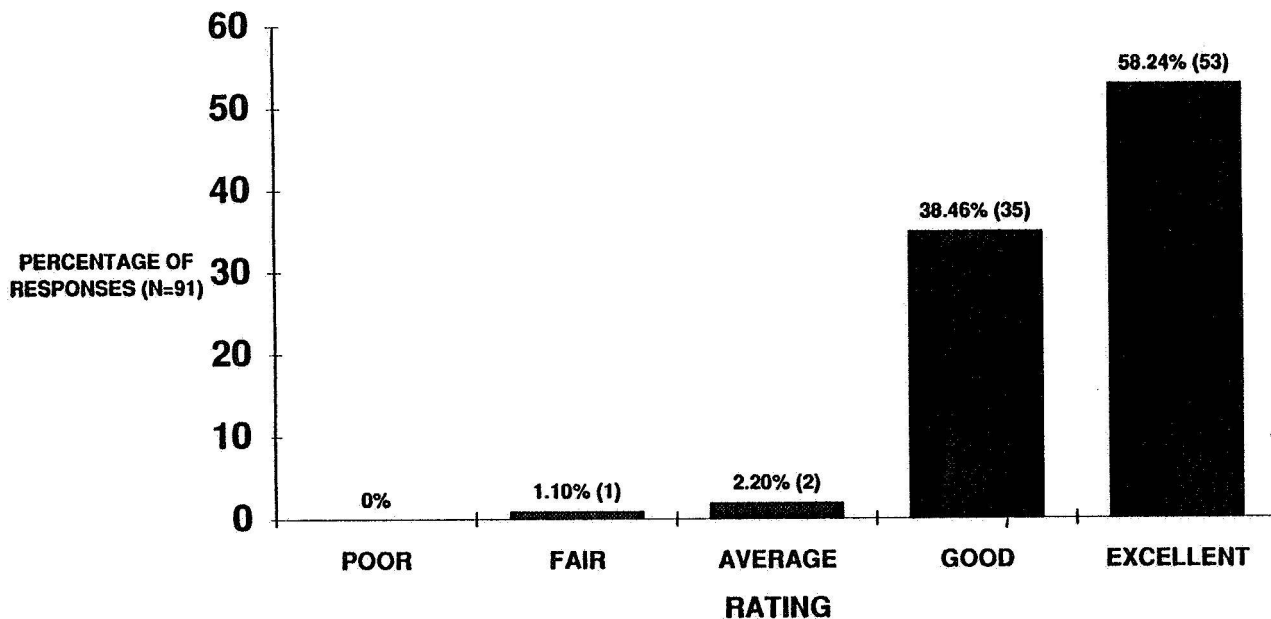
The 1992 LARSS Student Exit Survey is intended to serve as a tool for continuous improvement of the overall LARSS Program. That is, the LARSS Program participants are able to provide valuable information about the overall program by identifying those areas of the Program which need enhancing. The recommendations provided from this survey will be considered for the 1993 LARSS Program. Following are the results of the 1992 LARSS Program Student Exit Survey and the specific recommendations the participants have provided for continuous improvement of the LARSS Program.

## RESULTS

Each of the 91 Student Exit Surveys distributed was returned, thus yielding a return rate of 100%. The overwhelming majority of the LARSS participants (96.70%) rated their overall LARSS summer research experience as either good (38.46%) or excellent (58.24), while only 3.20% rated their experience as average (2.20%) or fair (1.10%). None of the 91 participants rated their summer research experience as poor.

Table 1. Overall Rating of LARSS Summer Research Experience

### OVERALL RATING OF LARSS EXPERIENCE





## **STUDENT RECOMMENDATIONS FOR CONTINUOUS IMPROVEMENT OF THE LARSS PROGRAM**

Following are student recommendations made for continuous improvement of the LARSS Program:

- (1) Students should be housed in the same apartment complexes;
- (2) Students should be notified of their mentor and research assignment prior to their tenure in the LARSS Program;
- (3) Mentors should be required to submit a proposed research project before the students are selected, and should be involved in more of the LARSS group activities;
- (4) Students should be notified of the payroll schedule and holidays prior to their tenure in the LARSS Program;
- (5) There should be both additional technical lectures and tours of the Center and Langley Air Force Base;
- (6) The length of the Program should be extended to twelve weeks;
- (7) A scholarship should be offered to one student from each Directorate for the best quality research project;
- (8) An oral presentation for each student should be required;
- (9) A Career Conference, combined with a forum where the students can share their individual research, should be held;
- (10) A more lengthy technical paper should be required;
- (11) A stipend scale should be matched to the student's educational level;
- (12) Provide more information on each individual Directorate; and
- (13) Possibly award college credit for the summer research experience.

## **SUMMARY**

The overwhelming majority of the LARSS participants rated their overall summer research experience as good or excellent. Even though the 1992 LARSS Program has met its' goals, all areas of the Program need to be considered for continuous improvement. Of the various recommendations provided by the participants, the following will be implemented in the 1993 LARSS Program: (1) LARSS participants will be housed in two or three apartment complexes, (2) mentors will be encouraged to contact their student before the beginning of the LARSS Program, (3) LARSS participants will be notified of a tentative payroll schedule before the Program begins, (4) LARSS participants will be strongly encouraged to give an oral presentation on their research project in their respective Divisions, and (5) a Career Conference, in conjunction with a forum where the participants can share their individual research projects will be held. The participant recommendations made in the 1992 LARSS Student Exit Survey will ensure a more successful and improved LARSS Program in 1993.

## 1992 LARSS PROGRAM PARTICIPANT EXIT SURVEY OF THEIR SUMMER RESEARCH EXPERIENCE AT LANGLEY

Dear LARSS Participant:

You are in a unique position to advise prospective LARSS participants by summarizing your responsibilities, by sharing the knowledge you have gained, and also by offering advice. Please take a few minutes to answer the following questions. Summary data of this exit survey will be included in the 1992 LARSS Program Final Report.

1. What were the skills or specific knowledge you brought to this summer research experience that helped you the most?

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2. Describe your duties and responsibilities in this program.

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3. What was the most valuable experience you gained from this program?

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4. What should an individual do to get the most out of this program?

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5. What are your suggestions for continuous improvement of this program?

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6. How would you rate your overall LARSS summer research experience?

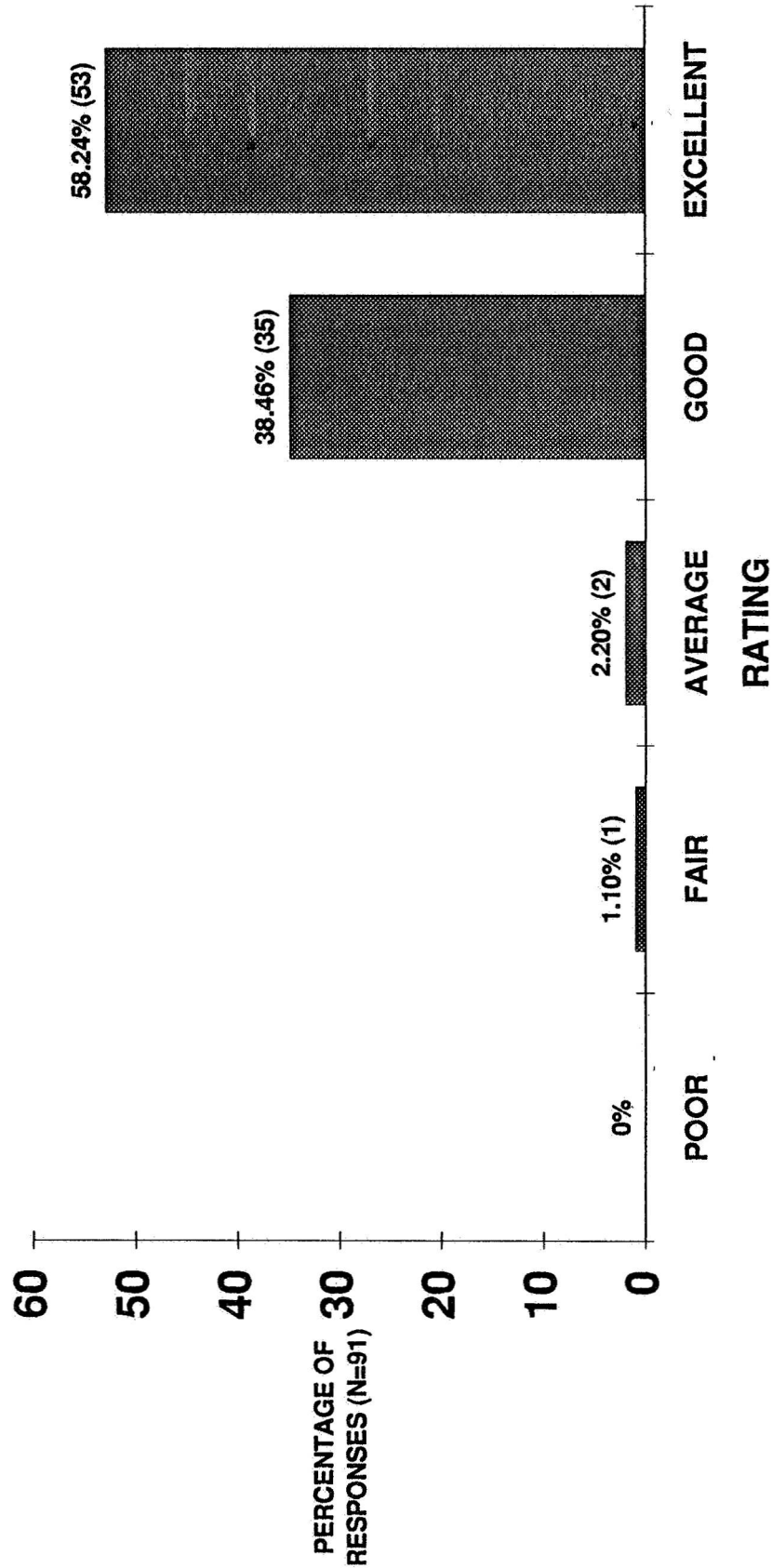
1	2	3	4	5
Poor	Fair	Average	Good	Excellent

Your Name (Optional): \_\_\_\_\_

Please return the completed survey by **August 7** to:

Suzanne Boyd, LARSS Program Coordinator  
Building 1312, Room 102

# OVERALL RATING OF LARSS EXPERIENCE



## Evaluation of LARSS Participant by Mentor

Student's Name: \_\_\_\_\_

Mentor's Name: \_\_\_\_\_

1. Give a brief statement of the LARSS participant's research program, and comment on the principal accomplishments during the grant period (may be continued on the back):

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2. In the rating scale below, describe the student by checking, after each trait to be evaluated, the box that most nearly represents your opinion. Compare the student with a representative group of students you have known during your professional career who have approximately the same amount of experience and training.

	Truly Excep- tional	Out- standing	Unusal	Good	Somewhat Above Average
a. Degree of mastery of fundamental knowledge in the general field.					
b. Knowledge of and ability to use basic research techniques in this field.					
c. Self-reliance and independence in scientific work.					
d. Motivation toward a successful productive scientific career.					

3. How does the student compare overall with other students you have supervised?

☐ Equal to The Best   
 ☐ Very Good   
 ☐ Above Average   
 ☐ Average   
 ☐ Below Average

4. Remarks: \_\_\_\_\_
- 
- 

 \_\_\_\_\_  
 Signature of Mentor

 \_\_\_\_\_  
 Date

Note to Mentor: This form should be returned to Suzanne Boyd, Mail Stop 105A, by Friday, August 14, 1992.

END  
DATE 9-17-93